Service
Service
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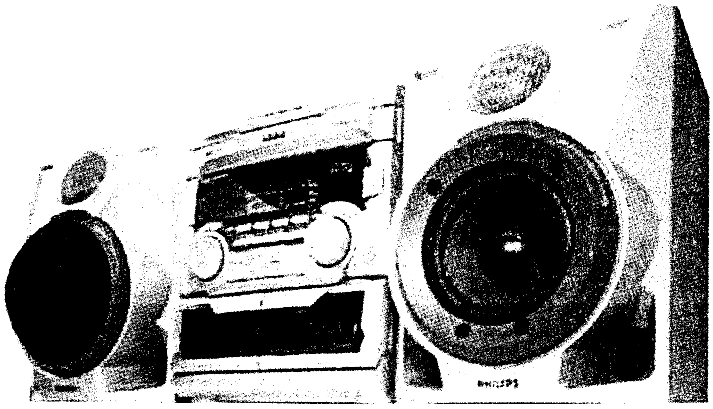

Service Manual

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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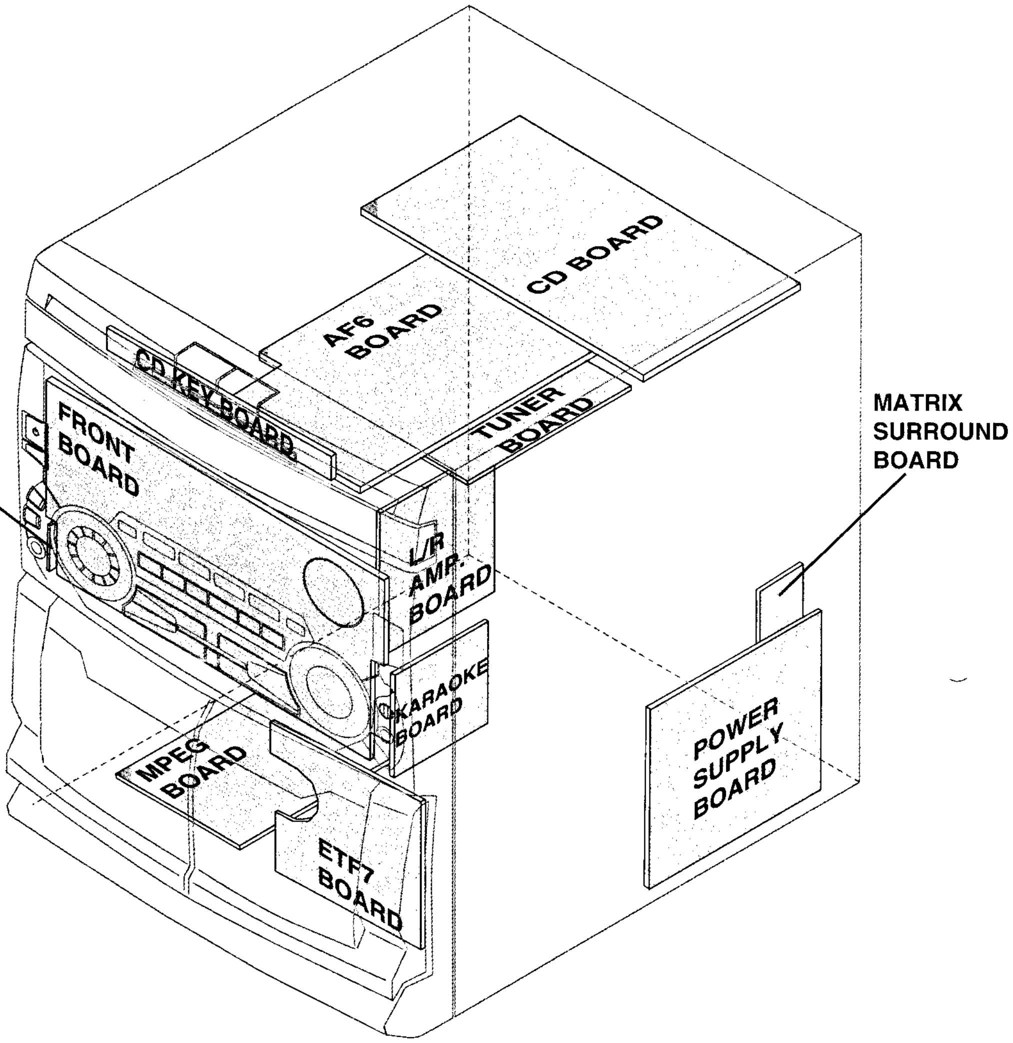
GB 3139 785 22240

PCS 103 751

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS


CD BOARD
AF6 BOARD
CD KEY BOARD
TUNER BOARD
MATRIX SURROUND BOARD
HEADPHONE BOARD
FRONT BOARD
L/R AMP. BOARD
KARAOKE BOARD
POWER SUPPLY BOARD
MPEG BOARD
ETF7 BOARD

VERSION VARIATIONS:

Type /Versions:	FW-V55		FW-M55					
Features & Board in used:	/21M	/21K	/22	/37				
Aux In	x	x	x	x				
Line Out	x	x	x	x				
Surround Out								
Subwoofer Out	x	x	x	x				
Digital Out								
Video Out	x	x						
Matrix Surround	x	x						
Dolby B								
RDS			x					
News			x					
Incredible Surround	x	x	x	x				
Karaoke Features	x	x						
Voltage Selector	x	x						
Low Power Standby (Clock Display Off)								
Tuner board - ECO5 Sys	x	x		x				
Tuner board - Tuner 95			x					
Surround Speakers		x						

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
120V for /37
220-230V for /22/34
Mains frequency : 50/60Hz
Power consumption : < 15W at Standby
75W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 390mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 25dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 22dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 5%]

AMPLIFIER:

Output power (6ohm, 1kHz, 10% THD)
L & R (FW-V55/21M/21K) : 2 x 50W
L & R (FW-M55/22) : 2 x 40W

Output power (6ohm, 60Hz-12.5kHz, 10% THD)
L & R (FW-M55/37) : 2 x 45W

Frequency response within -3dB : 40Hz-20kHz
Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF
Incredible Surround : IS ON (12 steps) , IS OFF
Digital Sound Control :
Optimal, Classic, Techno, Jazz, Rock, Vocal

Input sensitivity
Aux in (FW-V55/21M/21K) : 500mV ± 2dB at 1 kohm
Aux in (FW-M55/22/37) : 1V ± 2dB at 1 kohm
Microphone : 4.5mV ± 2dB at 600 ohm
Output sensitivity
Line out : 500mV ± 2dB at 22 kohm
Subwoofer out (max. vol.) : 1.5V ± 2dB at 22 kohm
Headphone out : 15mW ± 2dB at 32 ohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.45% (IEC)
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio (Unweighted), IEC I : > 43dB
Signal to noise ratio (Unweighted), IEC II : > 47dB

VIDEO CD:

Audio Performance

Measurement done at output conn. of the CDC module.
Frequency response within ± 3dB : 20Hz - 20kHz
Signal to Noise ratio (A-weighted) : > 80dBA
THD + noise (1kHz) : > 60dB
Channel unbalance (1kHz) : < 2dB
Channel separation (1kHz) : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

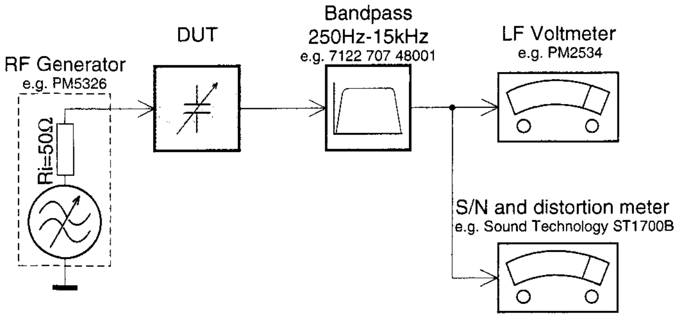
Video Performance

Video output level : 1.0 ± 0.2Vp-p
Luminance non-linear distortion : < 5%
Luminance S/N (Unweighted, PAL) : > 50dB

[....] Values indicated are for "Tuner 95 Board" only

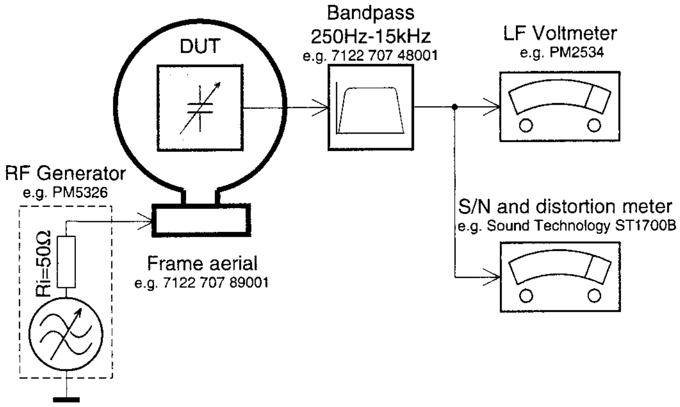
MEASUREMENT SETUP

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

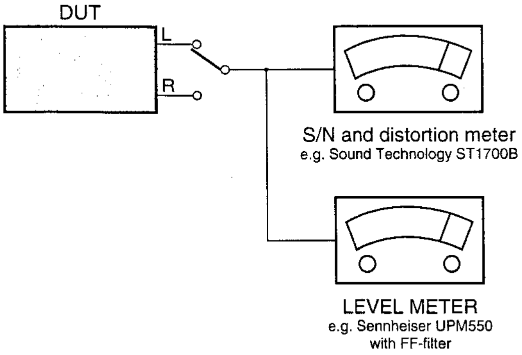
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

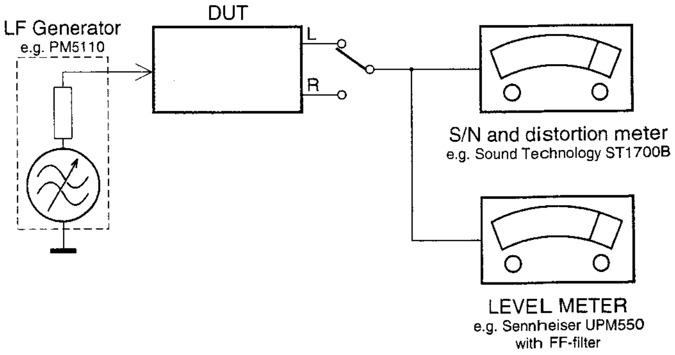
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

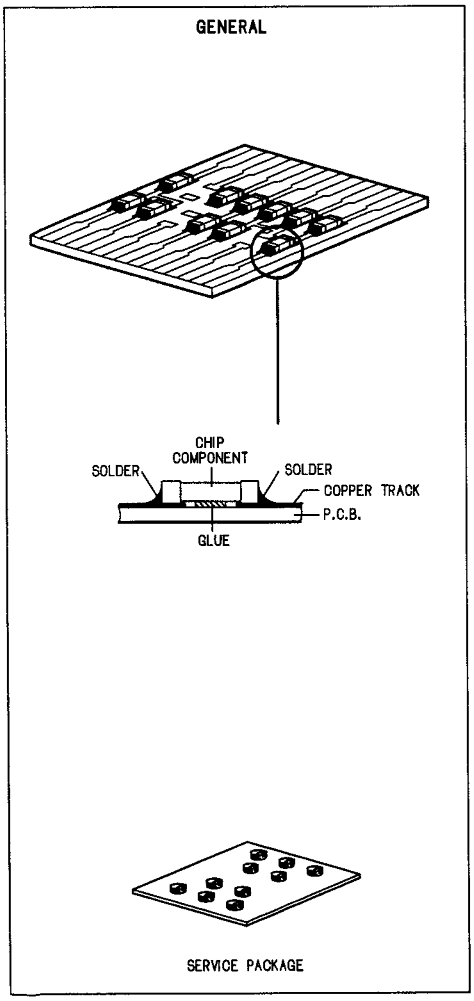
Compact Disc:

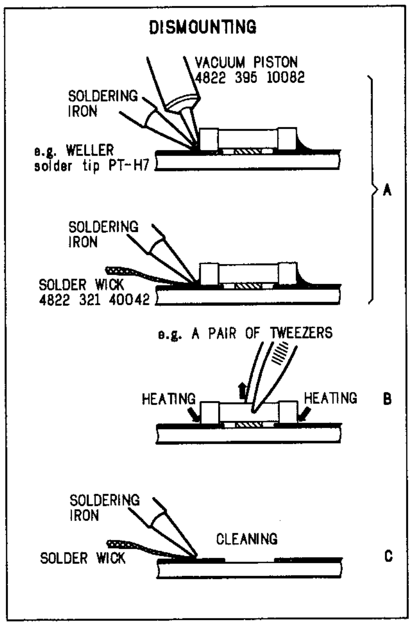
SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

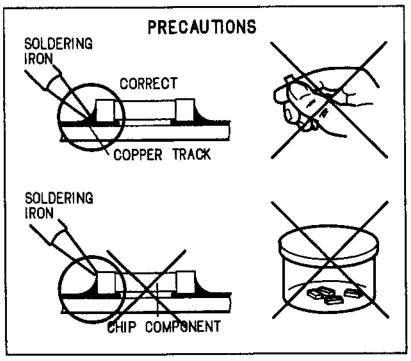
ESD Equipment:

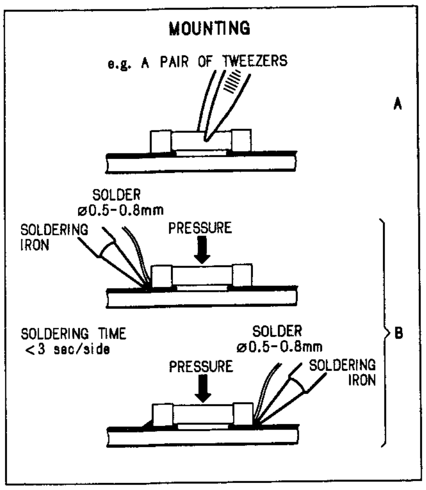
Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

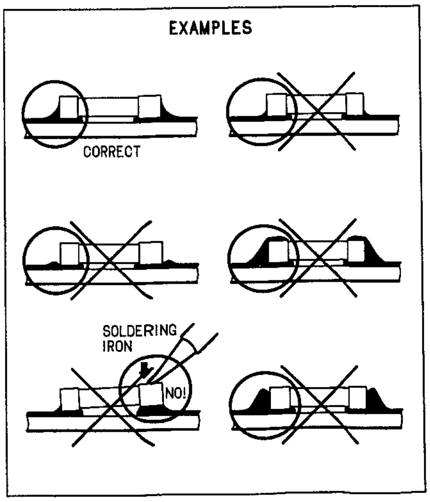
HANDLING CHIP COMPONENTS


GENERAL
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE


DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER solder tip PT-H7
A
SOLDERING IRON
SOLDER WICK 4822 321 40042
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
CLEANING
SOLDER WICK
C


PRECAUTIONS
SOLDERING IRON
CORRECT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT


MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER ø0.5-0.8mm
SOLDERING IRON
PRESSURE
SOLDERING TIME <3 sec/side
SOLDER ø0.5-0.8mm
PRESSURE
SOLDERING IRON
B


EXAMPLES
CORRECT
SOLDERING IRON
NO!

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

GENERAL INFORMATION

**IMPORTANT:
PLEASE NOTE THAT THE VOLTAGE SELECTOR LOCATED AT THE REAR OF THIS SYSTEM IS PRESET AT 220V FROM THE FACTORY. FOR COUNTRIES THAT OPERATE AT 110V, PLEASE ADJUST TO 110V BEFORE YOU SWITCH ON THE SYSTEM.**

General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Accessories *(Supplied)*

- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- One Video cinch cable

Safety Information

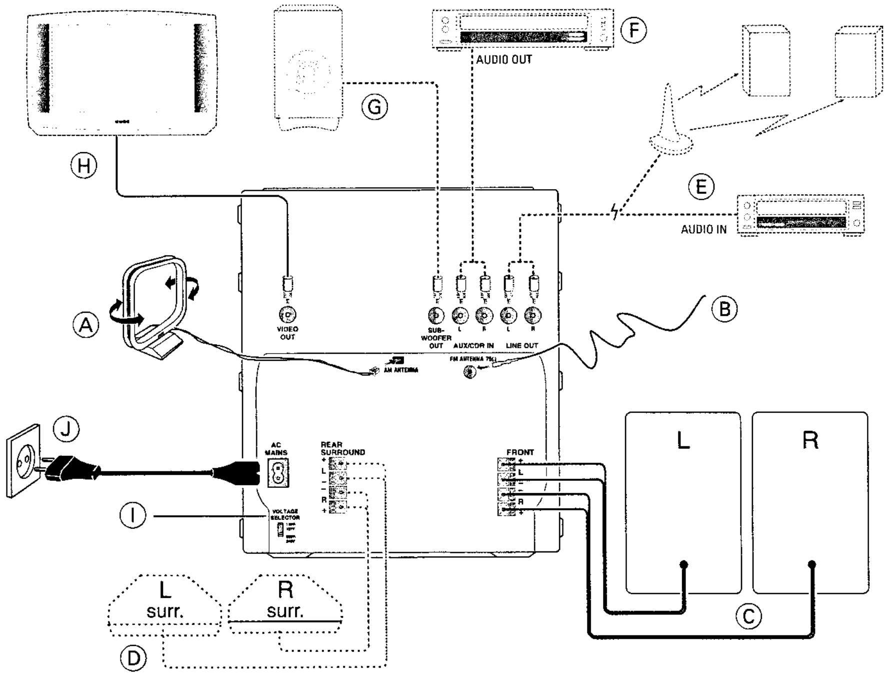
- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
  Allow at least 10 cm clearance from the rear and the top of the unit and 5 cm from each side.
- Do not expose the system to excessive moisture, rain, sand or heat sources.

SAFETY INFORMATION

- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the disc unit inside the system. Should this occur, the disc player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



Ⓐ AM Loop Antenna Connection

Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

Ⓑ FM Wire Antenna Connection

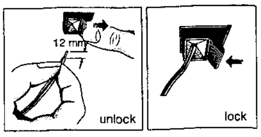
Connect the supplied FM wire antenna to the FM ANTENNA 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM ANTENNA 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speakers Connection

- Connect the right speaker to Front terminal R, with the colored wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the colored wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.



CAUTION:

- *For optimal sound performance, it is recommended to use the supplied speakers.*
- *Do not connect more than one speaker to any one pair of + / – speaker terminal.*
- *Do not connect speakers with impedance lower than the speakers supplied. Please refer to SPECIFICATION section of this manual.*

Ⓓ Rear Surround Speakers' Connection

Connect the optional Rear Surround Speakers to the REAR SURROUND terminals. Be sure to follow the instructions supplied with the Rear Surround Speakers.

Ⓔ Line Out Connection *(wireless ready)*

You can connect the audio left and right LINE OUT terminals to a optional CD Recorder ANALOG IN terminals. This allows you to record in an analog format.

You can also install additional optional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Note:
- *Availability of wireless transmitter and its peripherals are subjected to the approval of local authorities. Please check with respective local safety or approving authority.*

Ⓕ Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the AUX/CDR IN terminals at the rear of the system.

Ⓖ Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass sound effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

Ⓗ Video Out Connection

Connect the VIDEO OUT terminal at the rear of the system to the TV or VCR VIDEO IN for viewing or recording.

Ⓘ Adjusting the Operating Voltage

(for specific version only))

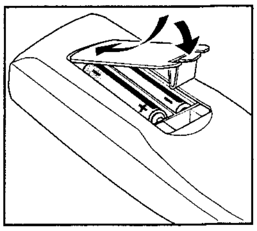
Before connecting the AC power cord to the wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓙ AC Power Supply

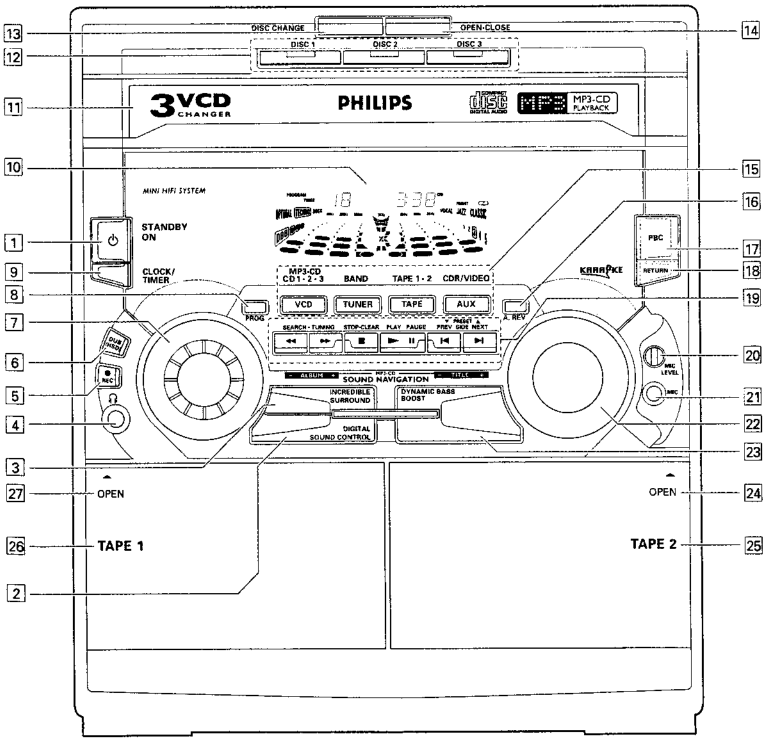
After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.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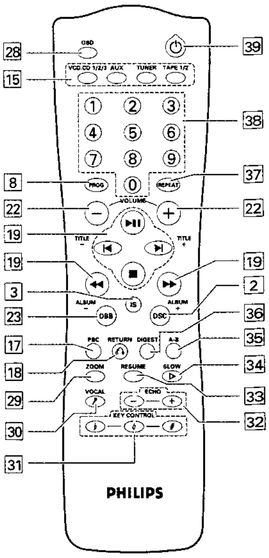
25
DISC CHANGE
OPEN·CLOSE
DISC 1
DISC 2
DISC 3
3VCD CHANGER
PHILIPS
MP3-CD PLAYBACK
MINI HIFI SYSTEM
STANDBY ON
CLOCK/TIMER
MP3-CD CD1·2·3
BAND
TAPE 1·2
CDR/VIDEO
VCD
TUNER
TAPE
AUX
PROG
A. REV
SEARCH·TUNING
STOP·CLEAR
PLAY PAUSE
PREV SIDE NEXT
PBC
RETURN
KARAOKE
ALBUM
TITLE
SOUND NAVIGATION
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL
MIC LEVEL
MIC
OPEN
TAPE 1
OPEN
TAPE 2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15
8
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38
37
22
19
2
36
35
34
33
32
OSD
VCD·CD 1/2/3
AUX
TUNER
TAPE 1/2
1
2
3
4
5
6
7
8
9
0
PROG
REPEAT
VOLUME
TITLE
ALBUM
DBB
IS
DSC
PBC
RETURN
DIGEST
A-B
ZOOM
RESUME
SLOW
VOCAL
ECHO
KEY CONTROL
PHILIPS

Controls on the system and remote control

1 **STANDBY ON**
- to switch the system on or to standby mode.
- to use for EASY SET.

2 **DIGITAL SOUND CONTROL (DSC)**
- to select the desired sound effect : OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.

3 **INCREDIBLE SURROUND**
- to switch on or off the surround sound effect.

4 **🎧**
- to connect headphones.

5 **REC (RECORD)**
- to start recording on tape deck 2.

6 **DUB (HIGH SPEED DUBBING [HSD])**
- to dub a tape in normal or fast speed.

7 **JOG**
- to select the desired equalizer display.
- to select the desired DSC setting. You must select the DSC feature first.
- to select the desired level of Incredible Surround Sound. You must select the Incredible Surround Sound feature first.

8 **PROGRAM (PROG)**

for VCD/CD/MP3-CD...to program disc tracks.
for TUNER ..... to program preset radio stations.
for CLOCK ..... to select 12 or 24 hour in clock setting mode *(on the system only).*

9 **CLOCK/TIMER**
- to view the clock, set the clock or set the timer.

10 **DISPLAY SCREEN**
- to view the current setting of the system.

11 **DISC CAROUSEL TRAY**

12 **DISC 1 / DISC 2 / DISC 3 (DISC DIRECT PLAY)**
- to select a disc tray for playback.

13 **DISC CHANGE**
- to change disc(s).

14 **OPEN•CLOSE**
- to open or close the disc carousel tray.

15 **SOURCE** – to select the following:

VCD / (CD 1•2•3) / (MP3•CD)
- to select VCD/CD/MP3 mode. When VCD/CD/MP3-CD playback is stopped, press to select the disc tray 1, 2 or 3.

Adjusting the TV System
- to select corresponding PAL or NTSC system of your TV set (exception Multi-system TV).

TUNER / (BAND)
- to select Tuner mode. When in tuner mode, press to select the waveband: FM or MW.

TAPE / (TAPE 1• 2)
- to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.

AUX / (CDR/VIDEO)
- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder). When in Aux mode, press to select either AUX or CDR.

16 **A. REV (AUTO REVERSE)**
- available in tape deck 2 only.
- to select the desired play modes (⌶ / ⊃ / ⊂⊃).

17 **PBC (PLAYBACK CONTROL)**
- to switch on or off PBC mode *(for VCD version 2.0 only).*

18 **RETURN**
- for VCD with PBC on to return to the previous MENU level during playback *(for VCD version 2.0 only).*

19 **MODE SELECTION**

SEARCH•TUNING ◀◀ ▶▶ (ALBUM −/+)

for MP3-CD only...to select previous/ next Album at stop mode
for VCD only...to move the zoom picture to the left or right.
for VCD/CD/MP3-CD...to search backward/forward during playback.
for TUNER ..... to tune to a lower or higher radio frequency.
for TAPE .... to rewind or fast forward a tape.
for CLOCK ..... to set the hour *(on the system only).*

STOP•CLEAR ■

for VCD/CD/MP3-CD...to stop disc playback or to clear a program.
for TUNER ..... to stop programming.
for TAPE .... to stop playback or recording.
for DEMO ...... *(on the system only)* to start or stop demonstration mode.

PLAY PAUSE ▶❚❚

for VCD/CD/MP3-CD...to start or interrupt playback.
for VCD only...to watch a still picture.
for TAPE .... to start playback.

PREV ⏮ / SIDE / NEXT ⏭ (PRESET ▼▲) (TITLE −/+)

for MP3-CD only...to select previous/ next Title.
for VCD only...to move the zoom picture down or up.
for VCD with PBC on ....
.... to select next or previous MENU.
.... to select next or previous VCD track during playback.
for VCD/CD ... to skip to the previous, or next track.
for TUNER ..... to select a preset station in memory.
for TAPE .... to select tape side (back or front) in tape deck 2 only.

---

for CLOCK ..... to set the minute *(on the system only).*

20 **MIC LEVEL**
- to adjust the mixing level for karaoke or microphone recording.

21 **MIC**
- to connect microphone jack.

22 **VOLUME**
- to increase or decrease the volume.

23 **DYNAMIC BASS BOOST (DBB)**
- to select a bass boost level or to switch off bass boost.

24 **OPEN**
- to open tape deck 2.

25 **TAPE DECK 2**

26 **TAPE DECK 1**

27 **OPEN**
- to open tape deck 1.

28 **OSD (ON SCREEN DISPLAY)**
- to switch on or off the on screen display on the TV screen.

29 **ZOOM**
- to enlarge a still picture on the TV screen *(for VCD operation only).*

30 **VOCAL**
- to fade out the vocal of the original song during VCD playback or to switch between mono or stereo mode during audio disc playback *(for VCD operation only).*

31 **KEY CONTROL (♭ ♮ ♯)**
- to change the key to suit your vocal range *(for VCD operation only).*

♭ .... to decrease vocal key level.
♮ .... to restore vocal key to original setting.
♯ .... to increase vocal key level.

32 **ECHO −/+**
- to adjust the echo level for karaoke *(for VCD operation only).*

33 **RESUME**
- to continue playback again from where you have stopped. Only when PBC mode is switched off *(for VCD operation only).*

34 **SLOW**
- to watch a VCD at a slower speed. There are 3 modes of selection *(for VCD operation only).*

35 **A - B**
- to playback a certain scene or passage of a VCD/CD repeatedly.

36 **DIGEST**
- to scan through a VCD or a particular track. There are 4 modes of selection *(for VCD operation only).*

37 **REPEAT**
- to repeat a disc track or the current disc.

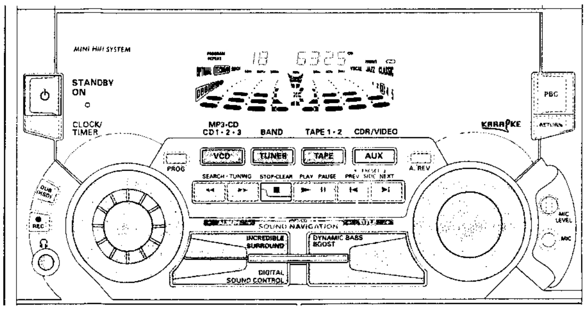
38 **DIGIT 0 – 9**

(numbers consisting more than two figures must be keyed in within 2 seconds.)

for VCD with PBC on ....
to select an entry level.
for VCD/CD/MP3-CD...to key in a disc track to start playback
or
.... to select another track during playback or
.... to select a track for programming.

39 **⏻**
- to switch the system to standby mode.

Notes for remote control:
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. VCD, TUNER, etc.).***
- ***Then select the desired function (▶, ⏮, ⏭, etc.).***



Important:
Before you operate the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

Notes:
- *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
- *When the system is switched to standby mode, the demonstration will resume 5 seconds later.*

To stop the demonstration mode
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → "DEMO OFF" is displayed.
  → The system will switch to standby mode.

Notes:
- *When the system is switched on from the main power outlet, the CD carousel tray may open and close again to initialize the set.*
- *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

To start the demonstration mode
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in standby mode.
  → The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations automatically.

- Press and hold **STANDBY ON** *(on the system only)* for ***5 seconds***, when the system is in standby or demonstration mode.
  → "EASY SET" will be displayed, and followed by "TUNER" and then "AUTO".
  → EASY SET will start searching for all radio on FM band and then followed by radio stations on MW band.
  → All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

Notes:
- *EASY SET will start with the FM band, if there are still presets available, the system will continue to store the MW band.*
- *When EASY SET is used, all previously stored radio stations will be replaced.*
- *The last preset radio station will appear on the display when EASY SET is completed.*

Switching the system ON
- Press **VCD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the DISC DIRECT PLAY buttons.

Switching the system to standby mode
- Press **STANDBY ON** or ⏻ on the remote control.
  → The system will switch to standby mode.

Selecting the Source
- Press the respective source selection button: **VCD**, **TUNER**, **TAPE** or **AUX**.
  → The display indicates the selected source.

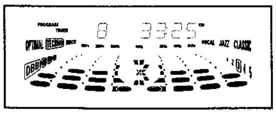
Note:
- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX/CDR IN terminals.*

Selecting the Equalizer Display

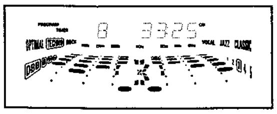
You can select the desired equalizer display for the system. You must not press the DSC or INCREDIBLE SURROUND button on the system before using the JOG control.

- Adjust the JOG control to select the desired Equalizer Display, NORMAL, TOP DOWN, or NITE MODE.
  → The selected display will be shown.

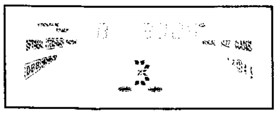
NORMAL Display



TOP DOWN Display



NITE MODE Display



Note:
- *In NITE MODE, all lights will be switched off and the display brightness will be dimmed.*

Sound Control

VOLUME ADJUSTMENT

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

INCREDIBLE SURROUND

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect. There are 12 different Incredible Surround levels available for selection.

- Press **INCREDIBLE SURROUND** to switch on.
  → The **INCREDIBLE SURROUND** display lights up.
  → "IS XX" will be displayed.

Note:
- *"XX" is the last selected Incredible Surround level.*

You can change the Incredible Surround level with the JOG.

- Adjust the JOG control to select the desired Incredible Surround level immediately after selecting the Incredible Surround feature.
  → The Incredible Surround level will increase or decrease between level 1 and 12.

To switch off Incredible Surround
- Press **INCREDIBLE SURROUND** again.
  → The **INCREDIBLE SURROUND** display is switched off.
  → "IS OFF" will be displayed.

DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to adjust the system to suit your type of music.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.
  → The selected digital sound is encircled.
  → "OPTIMAL X, CLASSIC, TECHNO X, JAZZ X, ROCK X or VOCAL X" will be displayed. "X" is the pre-selected level.

With the JOG control, you can change the level of any DSC setting except CLASSIC.

- First select the DSC feature, then adjust the JOG control until the desired digital sound setting level is reached.
  → The digital sound setting level will increase or decrease between level 1 and 5.

Note:
- *For neutral setting, select CLASSIC and switch off DBB.*

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

- Press **DBB** briefly to select a bass boost level.
  → The respective DBB level will be encircled and lit.
  → "BEAT", "PUNCH" or "BLAST" will be displayed.

To switch off DBB
- Press **DBB** briefly until "DBB OFF" is displayed.

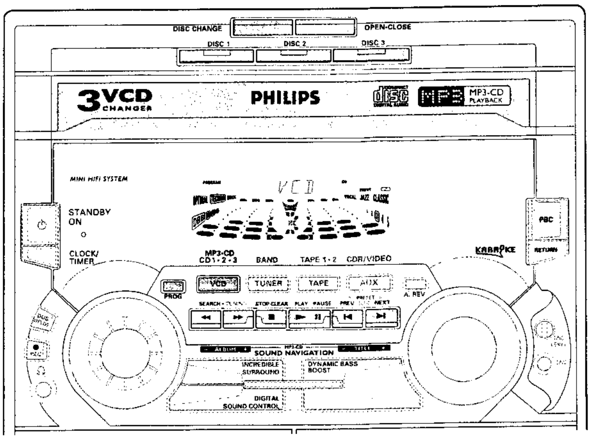
Note:
- *Some CDs or tapes might be recorded in high modulation, which causes a distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

OPERATING THE SYSTEM

Automatic DSC-DBB selection

The best DBB setting is generated automatically for each DSC selection. You can manually select the DBB setting that best suits your listening environment.

CD / VCD / MP3-CD



Warning!

1) This system is designed for conventional Discs. Do not use any accessories such as disc stabilizer rings or disc treatment sheets, etc., which may damage the disc mechanism.

2) Do not load more than one disc into each tray.

3) When the disc changer is loaded with Discs, do not turn over or shake the system. This may jam the changer.

The CD part of this system also serves as a Video CD player if you connect it to your TV set. You can load up to three discs in the disc changer for continuous playback without interruption.

Before viewing the Video CD, ensure that the set is switched to corresponding PAL or NTSC system of your TV set (exception Multi-system TV).

CD / VCD / MP3-CD

Discs for playback

This system can playback all audio CD, finalized audio CD-Recorder and MP3-CD format discs.

Note:

– For mixed mode discs, only one mode will be selected for playback depending on the recording format.

Loading the Disc Changer

1 Press **VCD** to select VCD/CD/MP3-CD mode.

2 Press **OPEN•CLOSE**.
→ The disc carousel tray slides out.

3 Load a disc with the printed side up in the right tray.

- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  → The disc carousel tray will rotate until the empty tray is ready for loading.
  → Playback will always start with the disc in the inner disc tray.

4 Press **OPEN•CLOSE** to close the disc carousel tray.
→ The total number of tracks and the playing time of the last selected disc appear on the display.

For MP3-CD only:
→ The first Album and the first Title information appear on the display.

Notes:

– To ensure good system performance, wait until the disc changer completely reads the disc(s) before proceeding.

– For MP3-CD, the disc reading time may exceed 10 seconds due to the large number of songs compiled into one disc.

Disc Direct Play

You can play a disc directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button.

Playing a normal disc

For normal VCD:

Ensure that the system is switched to the corresponding PAL or NTSC system of your TV set (except multi-system TV).

1 Press **PLAY ▶II** to start playback.
→ The disc tray, track number and elapsed playing time of the current track appear on the display.

- To interrupt playback, press **PAUSE ▶II**.
  → The playing time flashes.
- To resume playback, press **PLAY ▶II** again.

2 To stop playback, press **■**.

Note:

– During Disc Reading mode, if you press any button, "PLEASE WAIT" will be displayed.

Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

1 Press **DISC CHANGE**.
→ The disc carousel tray slides out.

2 Replace the discs in the left and right disc trays.

- If you press **DISC CHANGE** again during playback, the disc will stop playing.
  → The disc carousel tray will rotate until the inner tray is rotated out and is ready for changing.

3 Press **OPEN•CLOSE** to close the disc carousel tray.

Selecting a desired track

Selecting a desired track when playback is stopped

- Press **digit 0 – 9** on the remote control to select the desired track.
  → Playback will start immediately for the selected track.
  → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

- Press ⏮ or ⏭ *(or **digit 0-9** on the remote control)* until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.
- If you press ⏮ once it will skip to the beginning of the previous track and play the track.

For MP3-CD only

1 Press **ALBUM –/+** *(◀◀ or ▶▶)* until the desired Album appears on the display *(when playback is stopped)*.

2 Press **TITLE –/+** *(⏮ or ⏭)* until the desired Title appears on the display.
→ The selected track number and elapsed playing time appear on the display.

3 Press **PLAY ▶II** to start playback.

Searching for a particular passage during playback

- Press ◀◀ or ▶▶ to select 4 different search speed.
  → "FRX1" ; "FRX2" ; "FRX3" or "FRX4" is displayed on the TV screen when you select a fast rewind search.
  → "FFX1" ; "FFX2" ; "FFX3" or "FFX4" is displayed on the TV screen when you select a fast forward search.
  → Normal playback will begin at the end of the fast rewinding or forwarding of the selected track.
- Play returns to normal when **PLAY ▶II** is pressed or when a new track is selected.

Programming Tracks

Programming tracks of a loaded disc is possible when playback is stopped. The display will indicate the total tracks stored in the program. Up to 99 tracks can be stored in the memory in any order *(except for MP3-CD)*. When 99 tracks are stored and you attempt to store another track, the display will show "FULL".

Note:
- *Program cannot be used for VCDs when PBC is switched on. Switch off PBC before storing tracks from such a VCD.*

1 Load the desired discs in the disc trays.
2 Press the **VCD** (CD 1•2•3) button to select the disc tray.
  → Programming can only be done on the selected disc.
3 Press **PROG** to start programming.
  → The **PROGRAM** starts flashing.
  → It will cancel any previously programmed tracks and selected repeat mode.
4 Press I◀ or ▶I *(or **digit 0-9** on the remote control)* to select the desired track.
- For MP3-CD, press **ALBUM −/+** and **TITLE −/+** to select the desired Album and Title for programming.

5 Press **PROG** to store the track.
- Repeat steps ***4*** to ***5*** to store other tracks.

6 Press ■ once to end programming.
  → The total number of tracks programmed and total playing time appear on the display.

Notes:
- *For MP3-CD, total playing time will not be shown.*
- *If the total playing time is more than "99:59" then "-- : --" appears on the display instead of the total playing time.*
- *If the system is reading the disc, programming is not possible, "READING DISC" will be displayed.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Reviewing the program

Reviewing of program is possible only when playback is stopped.

1 Press I◀ or ▶I repeatedly to review the programmed tracks.
2 Press ■ to exit review mode.

Playing the program

1 Press **PLAY ▶II** to start program playback.
  → "PLAY PROGRAM" will be displayed.
  → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, all programmed tracks will be played repeatedly.
  → "PROGRAM" or "OFF" will be displayed.
  → The **REPEAT** and **PROGRAM** appear on the display.

2 Press ■ to stop program playback.

Note:
- *If you press any other DISC DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be cleared.*

Erasing the program *(when playback is stopped)*

- Press ■.
  → "PROGRAM CLEARED" will be displayed.

Note:
- *The program will be erased when the system is disconnected from the power supply. The system is switched to standby mode when you change source or when you change the program disc.*

Repeat *(only on remote control)*

You can play the current track or the current disc repeatedly during playback.

1 Press **REPEAT** on the remote control to select the various repeat modes.
  → "TRACK", "DISC" or "OFF" will be displayed.
  → The **REPEAT** appears on the display.
- The current track or disc will now be played repeatedly until you press ■.

2 Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
  → The **REPEAT** disappears from the display.

VIDEO CD

Adjusting the TV System

Before viewing the Video CD, ensure that the set is switched to corresponding PAL or NTSC system of your TV set *(exception Multi-system TV)*.

- Press and hold **VCD** for more than ***2 seconds*** to switch between PAL or NTSC TV system.
  → After TV system is selected, the set will automatically switch to the last TV system setting everytime the VCD source is selected.

Note:
- *Before adjusting the TV system, make sure that there is not MP3-CD disc in disc tray 1 during power up.*

OSD - On Screen Display

If you insert one or more VCDs/CDs, your TV screen will serve as an additional display for messages (e.g. PLAY, STOP), and information stored on the VCD/CD.

- Press **OSD** on the remote control repeatedly to switch ON or OFF.

When OSD is switched ON; you can see the following display on the TV screen.

Below is an example of the OSD message.

SINGLE ELAPSED
PLAY XX/TT MM:SS

Notes:
- *"XX" is the current track.*
- *"TT" is the total tracks.*
- *"MM" is in minutes.*
- *"SS" is in seconds.*

When OSD is switched off; there is no information indicated on the TV screen.

Playing a Video CD with PBC

VCDs with PBC (Play Back Control) will be indicated on the display of the set and on your TV screen as soon as they are inserted. PBC is a predefined play sequence stored on the VCD.

1 Switch on the TV, insert a VCD with PBC and press ▶ II to start playback.
2 MENU appears on the TV screen.

If a menu consists of a list of titles you can select a sequence directly.

1 Select your choice with the **digit keys 0 - 9** on the remote control. The VCD starts playing of the selected sequence automatically.
2 Press **RETURN** (↶) to go back to the previous menu.

Note:
- *If a menu consists of more than one page, it is possible to go through the pages with PREV./NEXT on the set or remote control.*

Switching off PBC

- It is possible to switch off PBC in STOP mode by pressing the **PBC** button. Now this VCD can be treated like a normal VCD.
  → The TV display will show < PBC OFF >.

Notes:
- *In PBC mode PROGRAM is not active.*
- *The MENU structure depends on the program stored on the VCD. Please refer to the information supplied with the disc.*

Slow

1 Press **SLOW** on the remote control to watch a VCD in a slow speed. There are 3 types of slow modes to select.
  → "SLOW 1", "SLOW 2" or "SLOW 3" appears on the TV screen.
2 Press ▶II again to resume playback at normal speed.

Note:
- *Audio is muted in Slow mode.*

Resume

This feature is also applicable to audio CD *(except for MP3-CD).*

1 Press ■ to stop playback.
2 Press **RESUME** on the remote control to start playback again from where you have stopped.
→ "RESUME" appears on the display.

Note:
- *Resume information is lost if you select another disc or the set is disconnected from the mains, the system is switched to standby mode or when you change source.*
- *Resume is not available when PBC mode is switched on.*

Pause

1 Press ▶II to have a still picture on the TV screen.
→ "PAUSE" appears on the TV screen.
2 Press ▶II again to continue playback.

Note:
- *Audio is muted during Pause.*

Zoom

This feature enables you to view a still picture frame in an enlarge mode.

After you have pressed ▶II to have a still picture on the TV screen.

1 Press **ZOOM** once to enlarge the still picture by 2 times.
→ "ZOOM" appears on the TV screen.
- You can move the zoom picture left or right by pressing ◀◀ or ▶▶ respectively.
- You can move the zoom picture down or up by pressing I◀ or ▶I respectively.

2 Press **ZOOM** once more to return to normal still frame.
3 Press ▶II again on the remote control to continue playback.

A-B Repeat

This feature is also applicable to audio CD *(except for MP3-CD).* To play a certain scene or passage of the disc repeatedly.

1 Press **A-B** on the remote control during playback to mark the start of the chosen scene or passage.
→ "SET A" appears on the display.
2 Press **A-B** again to mark the end of the chosen scene or passage.
→ "SET B" appears on the display.
→ The selected scene or passage is played repeatedly.
→ "PLAY AB" appears on the display.
3 Press **A-B** once more to return to normal playback.
→ "CLEAR AB" appears on the display.

Notes:
- *You can also cancel A-B Repeat by pressing I◀ or ▶I.*
- *You can only repeat a maximum of one track. Once it cross from one track to the next, the A-B marking is reset.*

Return ↶

- Press **RETURN** to return to the previous VCD disc MENU level. It is functional only for Video CD when PBC is switched on.

Digest

This feature allows you to scan through a VCD for a quick review. PBC mode must be switched off. There are four digest mode for selection.

1 Press **DIGEST**.
→ "DIGEST" appears on the display.
→ "1.INTRO SCAN", "2.DIGEST DISC", "3.DIGEST TRACK" and "4.EXIT DIGEST MENU" appear on the TV screen.

1. INTRO SCAN
2. DIGEST DISC
3. DIGEST TRACK

4. EXIT DIGEST MENU

- Press **digit 1** on the remote control to select "INTRO SCAN".
→ The first 10 seconds of each track are played.
- Press **digit 2** on the remote control to select "DIGEST DISC".
→ The first frame of each track appears on the TV screen.
→ Press **digit 0 – 9** on the remote control to playback the desired tracks.
→ Press I◀ or ▶I to view the previous or next page for additional information.

- Press **digit 3** on the remote control to select "DIGEST TRACK".
→ The first track of the selected disc will be divided into 9 parts and displayed on the TV screen.
→ Press **digit 0 – 9** on the remote control to playback the desired parts.
→ Press I◀ or ▶I to digest the next track.

2 Press **digit 4** on the remote control to select "EXIT DIGEST MENU".
→ Digest mode will be exited.

Vocal

This feature allows you to fade out the original vocal from a karaoke VCD. This feature is used together with Echo mode. You can also use it to select the different audio modes.

- **STEREO** – same effect as the original recorded disc.
- **STEREO VOCAL LEFT/RIGHT** – fade out the original vocal for special recorded Karaoke disc only *(with the ECHO mode switched on).*
- **MONO LEFT/RIGHT** – select the language on a bilingual VCD.

Ensure that Echo mode is switched on when press **VOCAL** to fade out the original vocal during STEREO VOCAL LEFT/RIGHT mode.

- Pressing **VOCAL** repeatedly allows you to select the following modes.
→ STEREO → STEREO VOCAL LEFT → STEREO VOCAL RIGHT → MONO LEFT → MONO RIGHT → STEREO ...

Echo

This feature allows you to add echo while singing or talking through a microphone.

- Press **ECHO** −/+ to decrease or increase the echo effect.
→ "ECHO -" or "ECHO +" appears on the display.

Note:
- *You are advised to put echo to the minimum level when you are not using the feature. Echo mode is switched off when echo is at the minimum level.*

Key Control (♭ ♮ ♯)

This feature allows you to change the key of your vocal range.

- Press ♭ to decrease vocal key level.
→ "KEY DOWN" appears on the display.
- Press ♯ to increase vocal key level.
→ "KEY UP" appears on the display.
- Press ♮ to restore vocal key to original setting.
→ "KEY FLAT" appears on the display.

MP3 Disc

Album

This feature allows you to view and select the next or previous MP3-CD Album when playback is stopped.

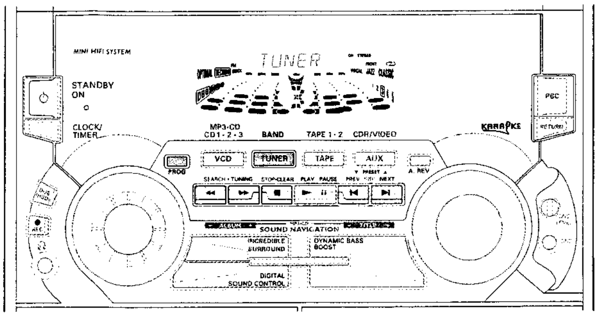
- Press **ALBUM** −/+ *(*◀◀ *or* ▶▶*)* to scroll through the previous or next Album name until the desired Album appears on the display.
→ The selected Album will appear on the display and follow by "AXX TXXX".

Title

This feature allows you to view and select the next or previous MP3-CD Title when playback is stopped.

- Press **TITLE** −/+ *(* I◀ *or* ▶I*)* to scroll through the previous or next Title name until the desired Title appears on the display..
→ The selected Title will appear on the display and followed by "AXX TXXX".

Note:
- *"A" represents ALBUM and "T" represents TITLE, "XX" or "XXX" is the current selected Album or Title number.*


MINI HIFI SYSTEM
TUNER
STANDBY ON
CLOCK/ TIMER
MP3-CD CD1·2·3
BAND
TAPE 1·2
CDR/VIDEO
KARAOKE
PBC
RETURN
VCD
TUNER
TAPE
AUX
PROG
A. REV
SOUND NAVIGATION
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL

Note:
- *For 'EASY SET' feature, please refer to page 11.*

Tuning to radio stations

1 Press **TUNER** (BAND) to select TUNER mode.
   → "TUNER" will be displayed.
   A few seconds later, the current radio frequency will be displayed.
2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
3 Press ◀◀ or ▶▶ for more than one second, then release.
   → The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER** (BAND).
2 Press **PROG** for more than one second.
   → The **PROGRAM** starts flashing and "AUTO" will be displayed.
   → The system will search for every available station in the FM waveband first, then search the MW waveband.
   → All available stations will be stored automatically. The frequency and preset number will be displayed briefly.
   → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
   → The system will remain tuned to the last stored preset radio station.

Notes:
- *You can cancel the automatic programming by pressing PROG or ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming, only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER** (BAND).
2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
3 Press **PROG** for less than one second.
   → The **PROGRAM** starts flashing.
   → The next available preset number will be displayed for selection.
4 Press ◀◀ or ▶▶ to tune to the desired frequency.
- If you wish to store the radio station to another preset number, press ▼ or ▲ to select the desired preset number.

5 Press **PROG** again.
   → The **PROGRAM** disappears and the radio station will be stored.
- Repeat ***steps 3 – 5*** to store other preset radio stations.

Notes:
- *When 40 radio stations are stored and you attempt to store another radio station, the display will show "FULL". If you want to change an existing preset number, repeat steps 3 – 5.*
- *You can cancel manual programming by pressing ■ (on the system only).*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press ▼ or ▲ to select the desired preset number.
   → The preset number, radio frequency, and waveband appear on the display.

Changing the MW tuning grid

(for specific version only)

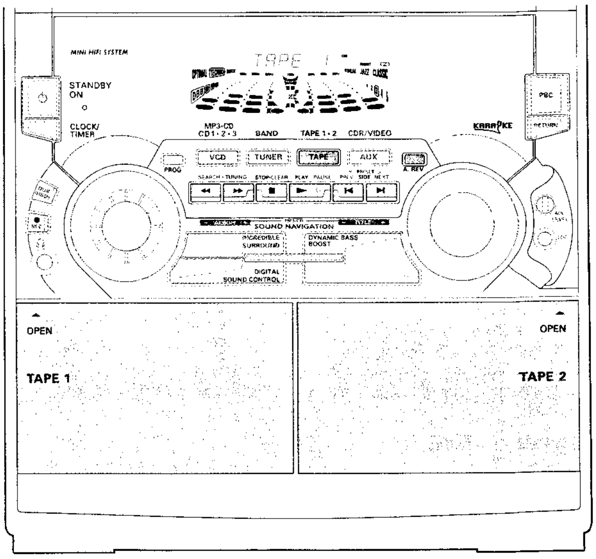
The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step preset in the factory is 9 KHz.

For MW Band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

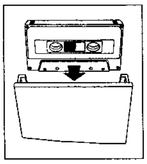
1 Disconnect the system from the AC power supply *(pull out the AC power cord).*
2 Press and hold **TUNER** and **TUNING** ▶▶ while reconnecting the system to the AC power supply.
   → Display will show "GRID 10" or "GRID 9".

Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset stations will also be erased.*


MINI HIFI SYSTEM
TAPE 1
STANDBY ON
CLOCK/ TIMER
MP3-CD CD1·2·3
BAND
TAPE 1·2
CDR/VIDEO
KARAOKE
PBC
RETURN
VCD
TUNER
TAPE
AUX
PROG
A. REV
SOUND NAVIGATION
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL
OPEN
TAPE 1
OPEN
TAPE 2

Loading a tape

1 Press **OPEN**.
2 The tape deck door opens.
3 Load the tape with the open side downward and the full spool to the left.
4 Close the tape deck door.



TAPE

Tape Side *(only on tape deck 2)*

- Press ⏮ or ⏭ to select the tape side for playback or recording.
  - → The **BACK** or **FRONT** appear on the display, depending on the tape side selected.
  - → "T2 <<<" or "T2 >>>" will be displayed.
  - → When recording, the **BACK** or **FRONT** display will be flashing.

Auto Reverse Playback *(only on tape deck 2)*

- Press **A. REV** to select the different playback modes.

⊐ ...... to record or playback on one side of the tape. The tape stops at the end of one side.

⊃ ..... to record or playback on both sides of the tape. The tape then stops.

⊂⊃ ... to playback continuously on both sides of the tape up to a maximum of 10 times per side unless you press ■.

Tape Playback

1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
   → "TAPE 1" or "TAPE 2" will be displayed, and followed by "T 1 or T2" with "<<< or >>>".
- Press **TAPE** (TAPE 1•2) again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.

3 Press ▶ to start playback.
- If tape 1 is selected for playback;
  → "T 1" with ">" scrolling right will be displayed.
- If tape 2 is selected for playback;
  → "T2" with "< or >" scrolling left or right will be displayed depending on the tape side selected.

3a*(for playback on tape deck 2 only)*
- Press ⏮ or ⏭ to select tape side *(see Tape Side)*.
- Press **A. REV** to select the different type of playback mode *(see Auto Reverse Playback)*.

4 Press ■ to end playback.
   → "T 1 or T2" with "<<< or >>>" will be displayed.

Rewind/Fast Forward

When playback is stopped

1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
   → If rewinding, "T 1 < or T2 <" with "<" scrolling left will be displayed.
   → If fast forwarding, "T 1 > or T2 >" with ">" scrolling right will be displayed
   → The tape will stop automatically at the end of the rewinding or fast forwarding.

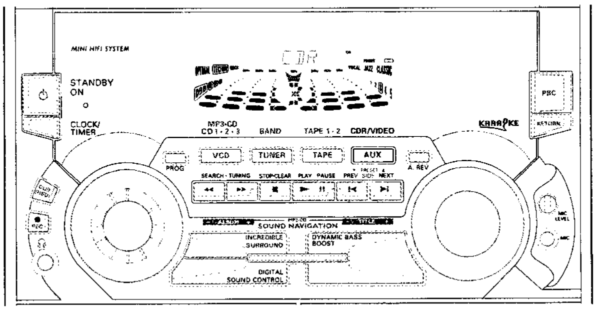
2 Press ■ to stop rewinding or fast forwarding.

During playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → "T 1 or T2" with "<< or >>" scrolling left or right will be displayed depending on which button is pressed.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
- *During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. VCD, TUNER, or AUX).*
- *Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).*

AUX/CDR



Selecting External Equipment

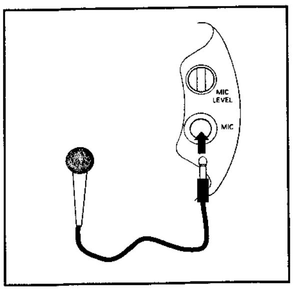
If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player, or CD Recorder) to the AUX/CDR IN terminals, you can hear the enhanced sound from the system.

1 Press **AUX** to select CDR mode.
   → "CDR" will be displayed.

2 Press **AUX** again to select the external (normal AUX) mode.
   → "AUX" will be displayed.

Notes:
- *There are two Auxiliary modes:*
  - *i. the normal AUX mode.*
  - *ii. the CDR mode, where the LINE OUT of this mini system is muted. You will not be able to record or listen to the sound from the LINE OUT.*
- *You are advised not to listen to and record from the same source simultaneously.*
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

KARAOKE



Microphone Mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.

2 Connect a microphone to the **MIC** socket.

3 Press **VCD**, **TUNER**, **TAPE** or **AUX**.

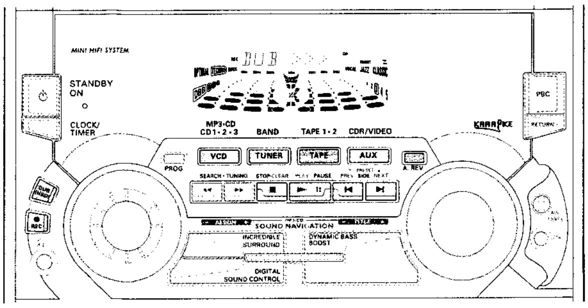
4 Play the selected source.

5 Adjust the volume level with **VOLUME** control.

6 Adjust the **MIC LEVEL** control to the mixing level that you want.

7 Start singing or talking through the microphone.

Note:
- *Keep the mic away from the speakers to prevent howling.*



Notes:
- *It is not possible to change tape side during recording.*
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (CrO_2).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of Volume, DBB, Incredible Surround or DSC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.*

Recording from other sources

(only on tape deck 2)

1. Press **TAPE** (TAPE 1•2) to select tape deck 2.
2. Load a blank tape into tape deck 2 with the open side downward.
3. Press ◀◀ or ▶▶ to select the recording tape side *(see Tape Side under TAPE section)*.
4. Press **VCD**, **TUNER** or **AUX**.
- Start playback of the selected source.
5. Press **REC** to start recording.
   → The **REC** starts flashing.
6. Press ■ to stop recording.

Notes:
- *Only ⇆ or ⊃ mode is available during recording.*
- *During recording, it is not possible to listen to another source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1. Press **TAPE** (TAPE 1•2) to select tape deck 2.
2. Load the prerecorded tape into tape deck 1 with full spool to the left and a blank tape into tape deck 2 with full spool aside.
3. Press ◀◀ or ▶▶ to select the recording tape side *(see Tape Side under TAPE section)*.
4. Press **DUB (HSD)** ***once*** for normal speed dubbing or ***twice*** *(within 2 seconds)* for high speed dubbing.
   → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed, followed by "DUB" with "< or >" scrolling left or right depending on the tape side selected.
   → The **HSD** appears on the display during high speed dubbing.
- Dubbing will start immediately.
   → The **REC** starts flashing.
5. Press ■ to stop dubbing.

Notes:
- *Only ⇆ mode is available during dubbing.*
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
- *You can listen to another source while dubbing.*

VCD/CD/MP3-CD Synchro Start Recording

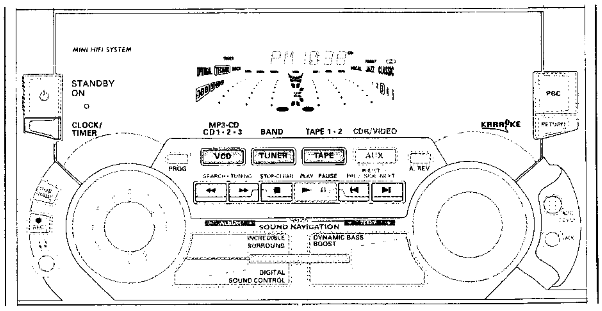
1. Load a blank tape into tape deck 2 and a disc into a disc tray.
2. Press **VCD** to select VCD/CD/MP3-CD mode.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, select the disc by pressing **VCD** (CD 1•2•3) and the tracks are recorded according to the order on the selected disc.
3. Press **REC** to start recording.
   → The **REC** starts flashing.
- Disc will start playback automatically.
4. Press ■ to stop recording.

Recording the mixed sound / One Touch Recording

- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
- For One Touch Recording, as soon as you press **REC**, the current source (VCD, TUNER or AUX) will be recorded on tape deck 2.

1. Load a blank tape in tape deck 2.
2. Press **REC** to start recording.
   → The **REC** starts flashing.
3. Press ■ to stop recording.

Note:
- *When you press RECORD while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.*



View Clock

You can view the clock (if it is set) if the system is in Standby mode or when any sound source is selected (CD, TUNER, etc.). The clock will be displayed for about 7 seconds.

- Press **CLOCK/TIMER** briefly.
   → "PM 10:38 or 22:38" (the current time) will be displayed depending on whether you have selected 12- or 24-hour mode.
   → "--:--" will be displayed if the clock is not set.

Clock Setting

The clock can be set in either 12- or 24-hour mode, e.g. "AM 12:00" or "00:00". Before setting the clock, you must be in the View Clock mode.

1. Press **CLOCK/TIMER** to select clock mode.
2. Press **PROG** *(on the system only)* to select 12- and 24- hour mode.
   → If 12-hour mode is selected, "AM 12:00" starts flashing.
   → If 24-hour mode is selected, "00:00" starts flashing.
3. Set the hour with ◀◀ or ▶▶ on the system.
4. Set the minute with ◀◀ or ▶▶ on the system.

5 Press **CLOCK/TIMER** again to store the setting.
→ The clock starts.

- To exit without storing the setting, press ■ on the system.

Notes:
– *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
– *When a power interruption occurs, the clock setting is erased.*

Timer Setting

- The system can switch on to VCD, TUNER, or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will increase from the minimum level until the volume level before the set is switched to standby mode.**

1 Press and hold **CLOCK/TIMER** for more than ***2 seconds*** to select timer mode.
→ " AM 12:00" or "00:00" or the last timer setting starts flashing depending on whether you have selected 12- or 24-hour mode.
→ The TIMER starts flashing.
→ The selected source is lit while other available sources are flashing.
2 Press **VCD, TUNER** or **TAPE** to select the desired source.
- Before selecting VCD or TAPE, make sure a disc or tape is loaded in the disc tray or tape deck 2.

3 Press ◀◀ or ▶▶ on the system to set the hour for the timer to start.
4 Press ⏮ or ⏭ on the system to set the minute for the timer to start.
5 Press **CLOCK/TIMER** to store the start time.
→ The timer is now set.
→ The TIMER remains on the display.
- At the preset time, the timer will be activated.
→ The selected source will be played.

Notes:
– *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
– *If the source selected is TUNER, the last tuned frequency will be switched on.*
– *If the source selected is VCD, playback will begin with the first track of the disc tray 1 or other trays if disc tray 1 is empty. If all the disc trays are empty, the TUNER will be selected instead.*
– *If the source selected is TAPE, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*
– *The timer will not activate if a recording is in progress.*

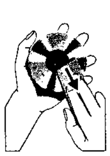
To switch off the TIMER
1 Press and hold **CLOCK/TIMER** for more than ***2 seconds***.
2 Press ■ on the system to cancel the timer.
→ The timer is now switched off.
→ The display will show "OFF" and the TIMER disappears.

To start the TIMER again *(for the same preset time and source)*
1 Press and hold **CLOCK/TIMER** for more than ***2 seconds***.
2 Press **CLOCK/TIMER** again to store the start time.
→ The timer is now on.
→ The TIMER appears on the display.

Maintenance

Cleaning the Cabinet
- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the disc lens
- After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

Cleaning the Heads and the Tape Paths
- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape once.

Demagnetizing the heads
- Use a demagnetizing tape available at your dealer.

Warning! Under no circumstances should you try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

Disc Player Operation

"UNREADABLE DISC" is displayed.
- The disc is inserted upside down.
→ *Place disc with printed side up.*
- Moisture condensation at the lens.
→ Wait until lens has adjusted to normal room temperature.
- The disc is dirty, badly scratched or warped.
→ *Clean or replace the disc.*
- The disc lens is dirty or dusty
→ *See section under Maintenance (page 27).*
- A CD-RW disc or an incorrect MP3-CD format disc is inserted.
→ *Replace a readable disc or correct recorded format MP3-CD.*

"NO DISC" is displayed.
- There is no disc in the disc tray.
→ *Insert a disc.*

No picture on TV screen.
- The video cable is not connected.
→ *Connect the cable between the system and TV.*

No colour on TV.
- The system switch is not correct.
→ *Change the system to respective setting (PAL or NTSC).*

Cannot adjust the TV system to PAL or NTSC.
- There is a MP3-CD in disc tray 1.
→ *Remove the MP3-CD from disc tray 1 or press DISC CHANGE to select a non-MP3 disc tray before adjusting the TV system.*

TROUBLESHOOTING

Radio Reception

Poor radio reception.
- The signal is too weak.
- → *Adjust the antenna.*
- → *Connect an external antenna for better reception.*
- The TV or VCR is too close to the stereo system.
- → *Separate the stereo system from the TV or VCR.*

Cannot tune to station
- Wrong tuning grid.
- → *Switch to the correct tuning grid.*

Tape Deck Operation

Recording or playback cannot be made or there is a decrease in audio level.
- Dirty tape heads, capstans or pressure rollers.
- → *See section on tape deck maintenance (page 27).*
- Magnetic build-up in the record/ playback head.
- → *Use demagnetizing tape.*

Tape deck door cannot open.
- Power failure or AC power plug disconnect from the wall outlet during tape playback.
- → *Reconnect the AC power plug and switch on the system again.*

General

System does not react when any button is pressed.
- Electrostatic discharge.
- → *Press STANDBY ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.*

No or poor sound.
- Volume is not turned up.
- → *Adjust VOLUME.*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly.*
- → *Make sure the stripped speaker wire is clamped.*
- The MP3-CD bit rate below 128 kbps.
- → *Make sure the MP3-CD was recorded with minimum 128 kbps bit rate.*

Reversed left and right sound.
- Speakers are connected wrongly.
- → *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.
- Speakers are connected wrongly.
- → *Check the speaker connection for proper phasing, colored/black wires to colored/black terminals.*

Remote control has no effect on the system.
- Wrong source is selected.
- → *Select the source (VCD, TUNER, etc.) before pressing the function button (▶, ⏮, ⏭, etc.).*
- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated.*
- Batteries are exhausted.
- → *Replace the batteries.*

Timer is not working.
- Clock is not set.
- → *Set the clock.*
- Timer is not switched on.
- → *Press CLOCK/TIMER to switch on the timer.*
- Recording is in progress.
- → *Stop recording.*

Clock setting is erased.
- There was a power failure.
- → *Reset the clock.*

System displays features automatically; buttons flash continuously.
- Demonstration mode is switched on.
- → *Press and hold ■ (on the system only) for 5 seconds to switch off the demonstration.*

There is a howling sound at the external source.
- You hear feedback when you are listening from AUX mode.
- → *Press AUX to select CDR mode.*

All lighted buttons are not lit.
- Equalizer Display is switched on in NITE mode.
- → *Adjust JOG to select other Equalizer Display.*

Additional Features For FW-M55/22

TUNER

Receiving RDS Radio Station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The radio station name is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (and the radio station name will appear on the display:

- The display normally shows the radio station name if available.
  By repeatedly pressing **RDS** button you can change the type of display information:
  - → The display shows in turn: STATION NAME → PROGRAM TYPE → RADIO TEXT → TUNED FREQUENCY → STATION NAME ...

Note:
- *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Clock

Some RDS station may be transmitting a real clock time at an interval of every minute.

Setting the time with RDS clock

1 Press **CLOCK/TIMER**.
   → "- - : - -" or current time appears on the display.
2 Press **CLOCK/TIMER** once more to enter clock setting mode.
   → "00:00" or current time starts flashing.
3 Press **RDS**.
   → The message "SEARCH RDS TIME" will be displayed.
   → If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
   → When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.
   → If within 90 seconds, the RDS time is not detected, "NO RDS TIME" will be displayed.

Note:
- *Some RDS station may be transmitting a real time clock at a minute interval. The accuracy of the transmitted time depends on the transmitting RDS station.*

NEWS/TA (Traffic Announcement)

(only available in Radio Station with RDS)

You can activate NEWS or TA function in Standby, Demonstration or any source mode except Tuner mode. Once the News Program Type (for NEWS function) or Traffic Announcement data (for TA function) is detected in any of the selected RDS stations, it will switch to TUNER mode automatically.

NEWS/TA key toggles in the following sequence :

NEWS → TA → OFF → NEWS

To start NEWS or TA function

1 Press **NEWS/TA** to select NEWS function.
   → The **NEWS** and "NEWS" will be displayed.
- If you want to select TA function, press **NEWS/TA** again.
   → The **TA** and "TA" will be displayed.

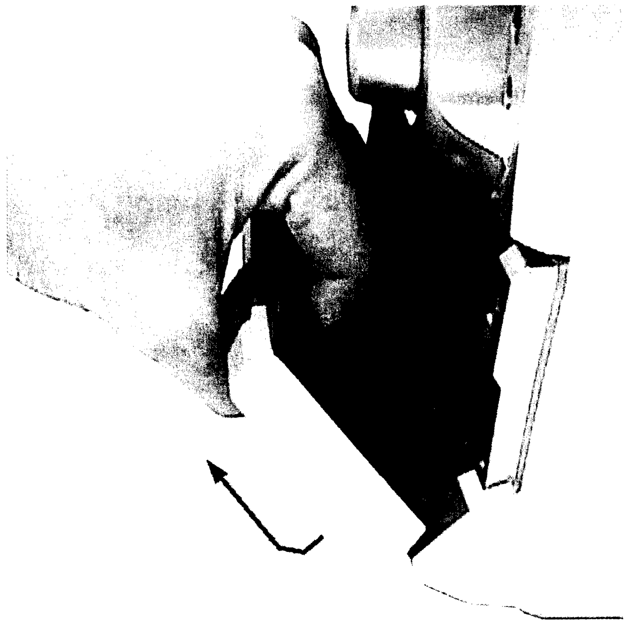
2 When NEWS or TA is selected;
- It will scan stations stored in the first 5 preset and wait for the News Program Type / Traffic Announcement data to be available in any of these RDS stations. During the search :
   → The current source activity will remain uninterrupted.
   → If no RDS station is found in the first 5 presets, the NEWS/TA function will be switched off. The display will show "NO RDS NEWS" or "NO RDS TA" and **NEWS** or **TA** will disappear from the display.
- When NEWS/TA transmission is detected, the system will switch to Tuner mode.
   → The **NEWS** or **TA** starts flashing.

To cancel NEWS or TA function
- Press **NEWS/TA** until the **NEWS** or **TA** disappears and "TA OFF" is displayed.

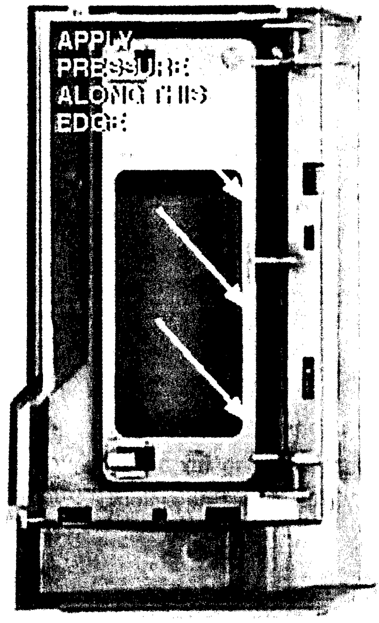
Notes:
- *If you are listening to a non RDS TUNER radio station and should you decide to hear NEWS or TA, first select other source (e.g. CD, TAPE or AUX), then press NEWS/TA.*
- *Before using the NEWS or TA feature, ensure that the first 5 presets are RDS stations.*
- *The NEWS/TA works only once for each activation.*
- *During News bulletin or Traffic Announcement, you can press any available source or Tuner function keys to cancel NEWS/TA function and execute the relevant source mode.*
- *If set is switched to Tuner source, the NEWS/TA function will be cancelled, "NEWS OFF" or "TA OFF" will be displayed immediately after the "TUNER" message.*

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover



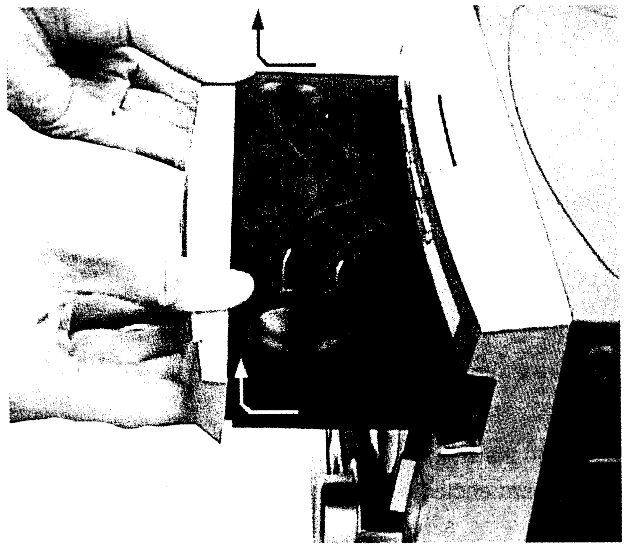
Remove Cassette Cover



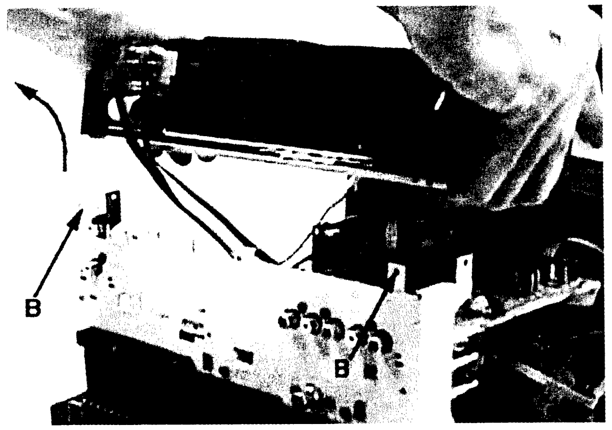
Cassette Cover

Dismantling of the CDC Module and Front Panel

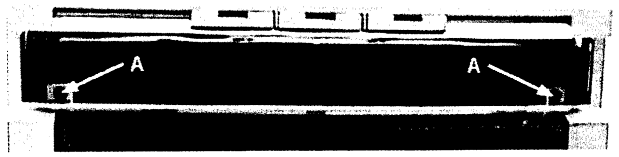
1) Loosen the 18 screws to remove the Cabinet Rear (pos 259) of the set :-
   - 5 screws each on the left side & right side of the Cabinet Rear.
   - 8 screws at the rear of the Cabinet Rear.
2) Slide out the CDC tray and remove the Cover Tray CDC (pos 107) as indicated.
3) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
4) Remove 1 screw (pos 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 231).



Remove Cover Tray CDC



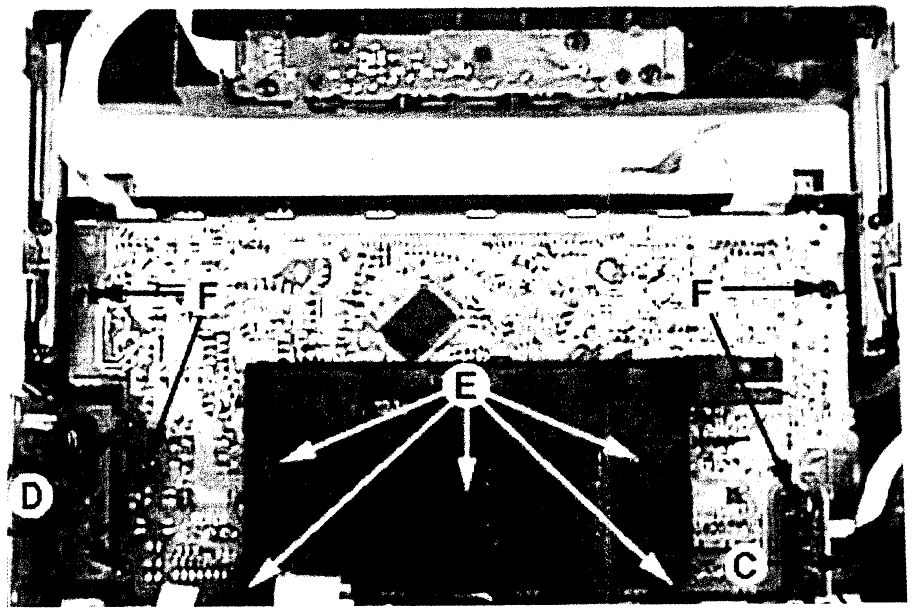
Remove CDC Module



Front View CDC

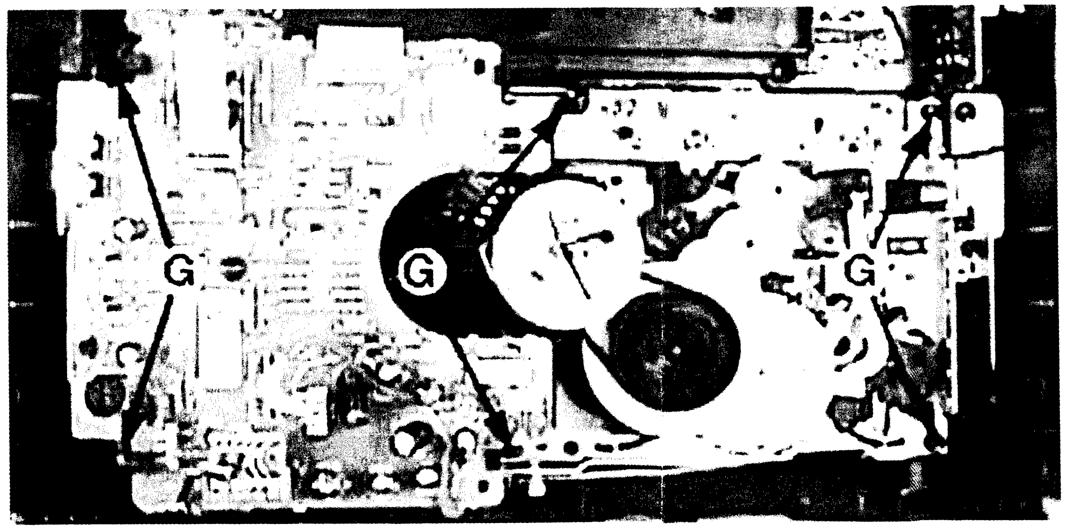
Dismantling of the Front Board

1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-A).
2) Remove 2 screws D as indicated to loosen the Karaoke Board (pos 1102-C) for set with Karaoke.
3) Remove 5 screws E as indicated to loosen the Plate Front (pos 254).
4) Remove 4 screws F as indicated to loosen the Front Board (pos 1102-A).



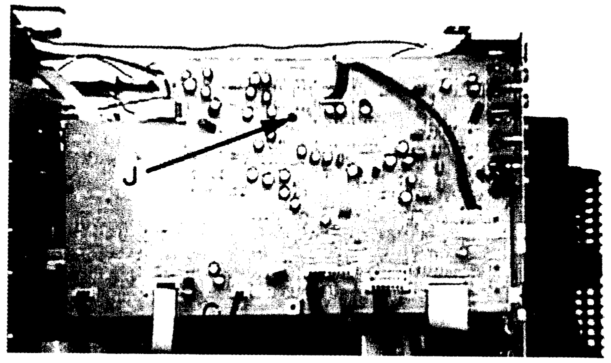
Dismantling of the ETF Module

1) Remove 6 screws G as indicated to loosen the ETF Module (pos 1105).

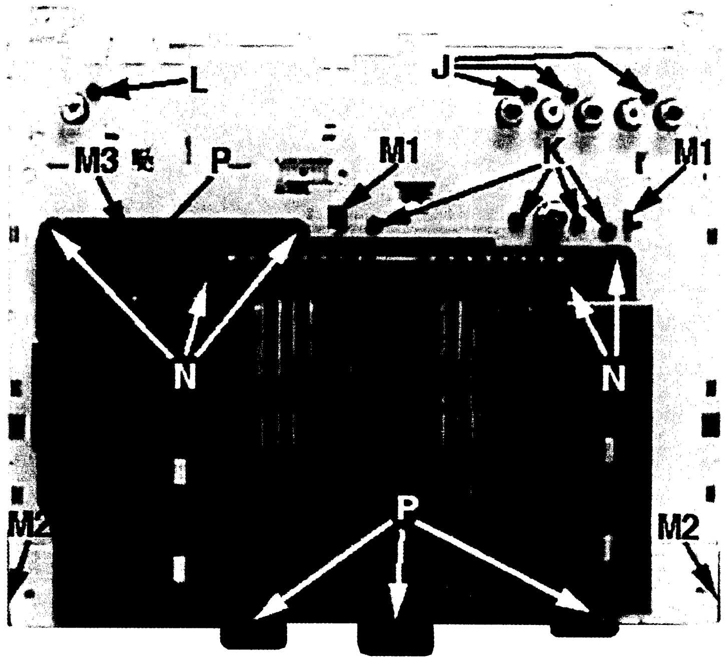


Dismantling of Rear Portion

1) Remove 4 screws J as indicated to loosen the AF Board (pos 1101-B).
2) Remove 1 screw L as indicated to loosen the Video Out Board (pos V1001A) for set with Video Out.
3) Remove 4 screws K and uncatch M1 as indicated to loosen the Tuner Board (pos 1100).
4) Remove 5 screws N and uncatch M2 as indicated to take out the Plate Rear (pos 229).
5) Remove 4 screws P and uncatch M3 as indicated to free the Power Module (pos 1103) from the Bottom Plate assembly.

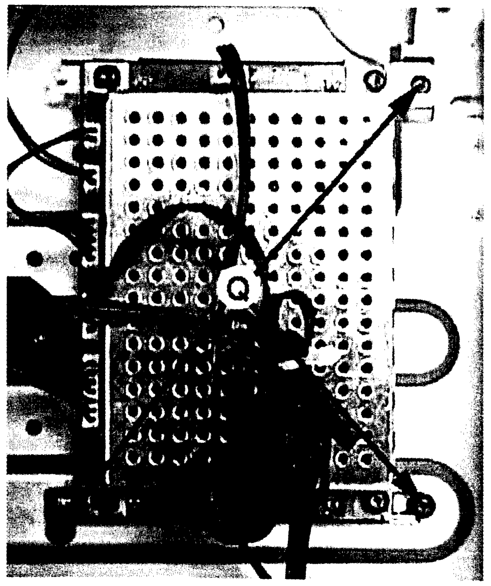


Top View AF Board



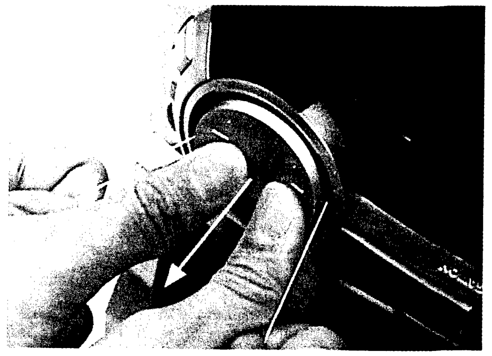
Dismantling of MPEG Portion

1) Remove 3 screws Q as indicated to loosen the MPEG Board & frame assembly (pos V1106).



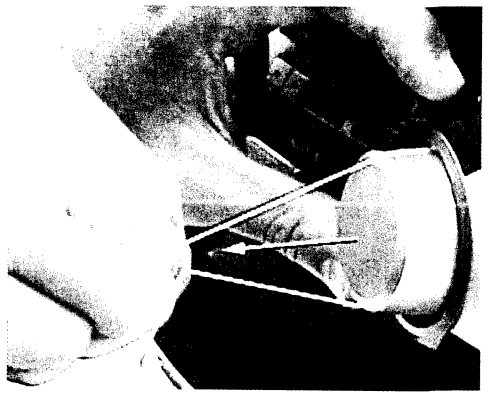
Repair Hints

1) The Jog Rotary (pos 142) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 1.



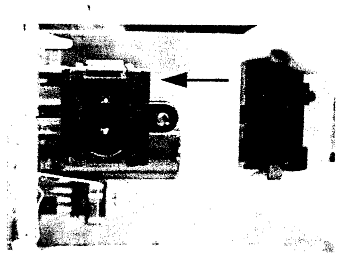
Picture 1

2) The Knob Volume Rotary (pos 140) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 2.

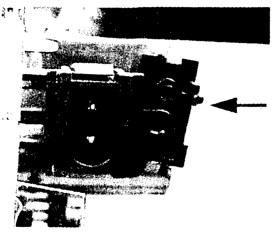


Picture 2

3) During re-assembly of the Power Module, place the Bracket Mains Socket (pos 232) behind the Mains Socket and catch it onto the Rucksack (pos 1103-201)of the Power Module. See pictures 3 and 4.



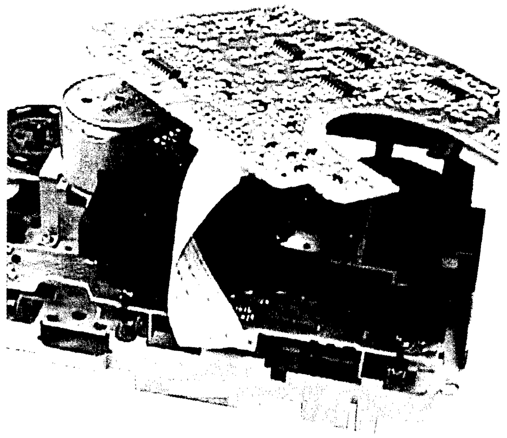
Picture 3



Picture 4

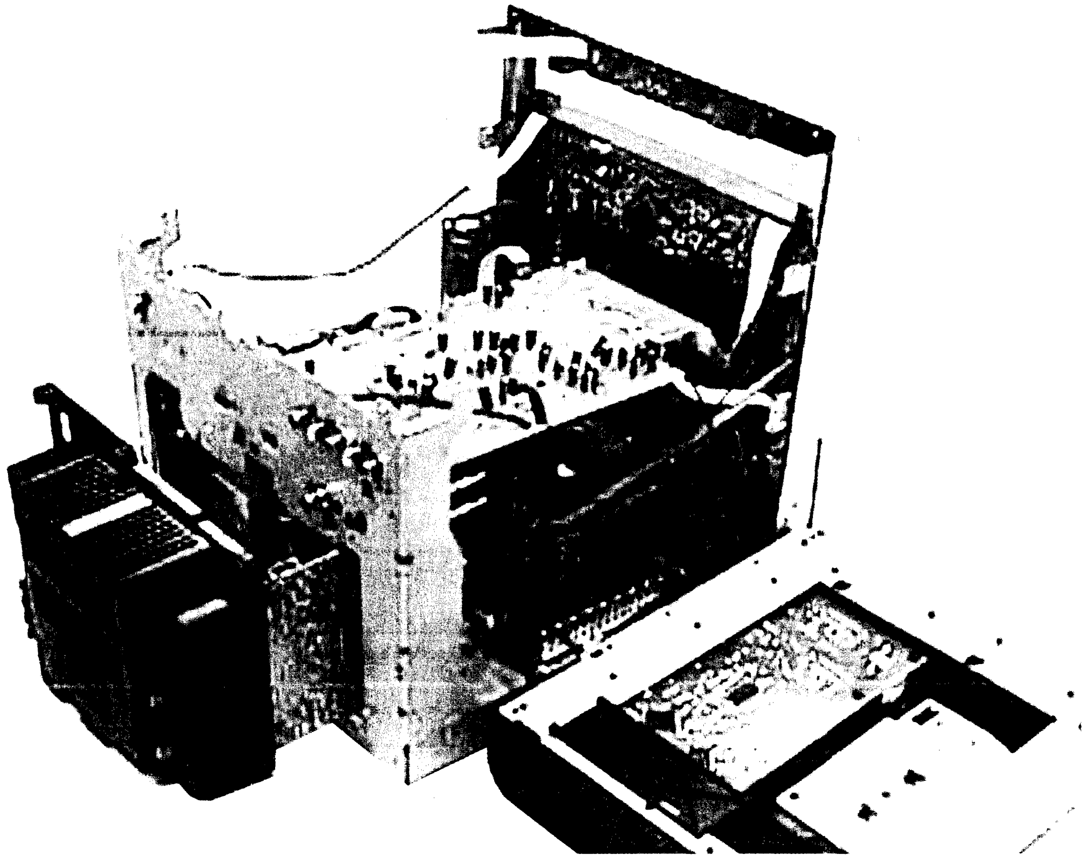
4) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 5.

5) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

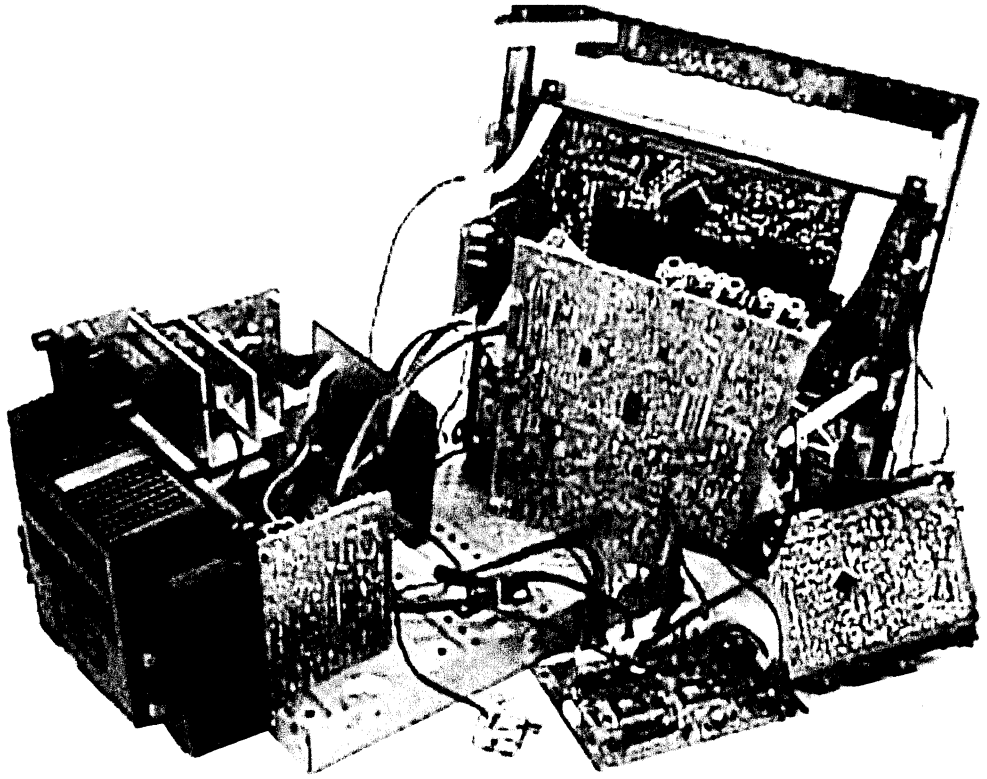


Picture 5

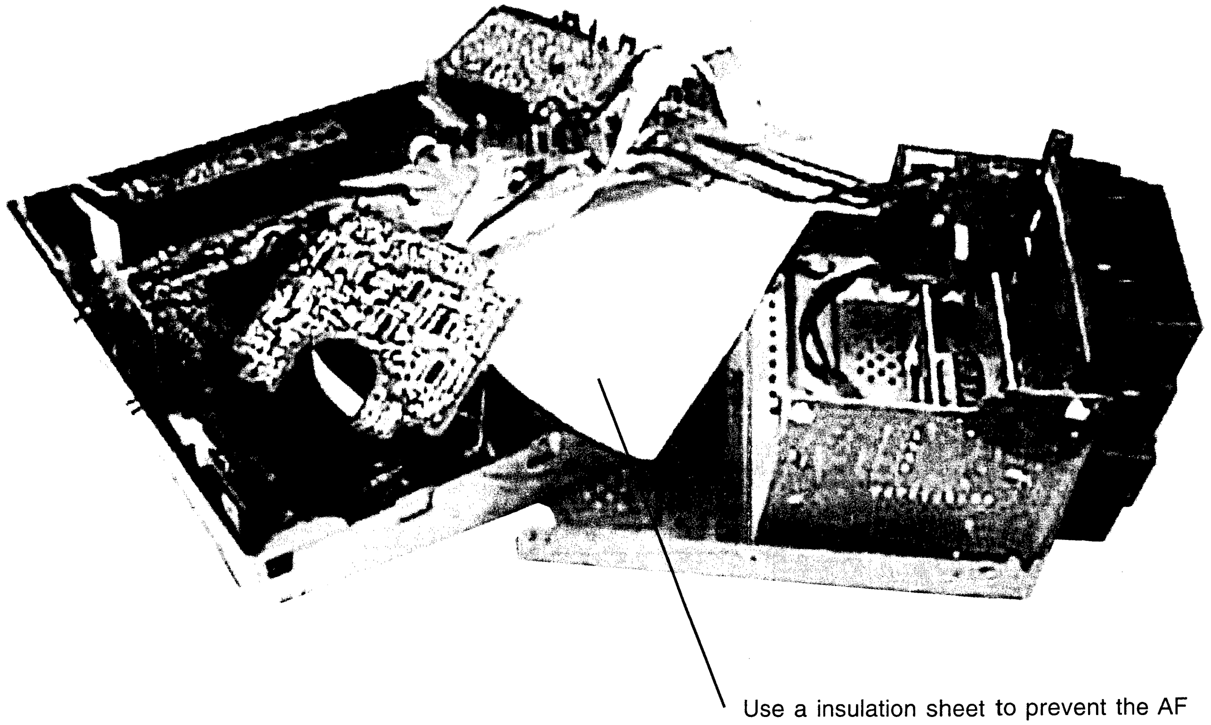
Service pos A



Service pos B



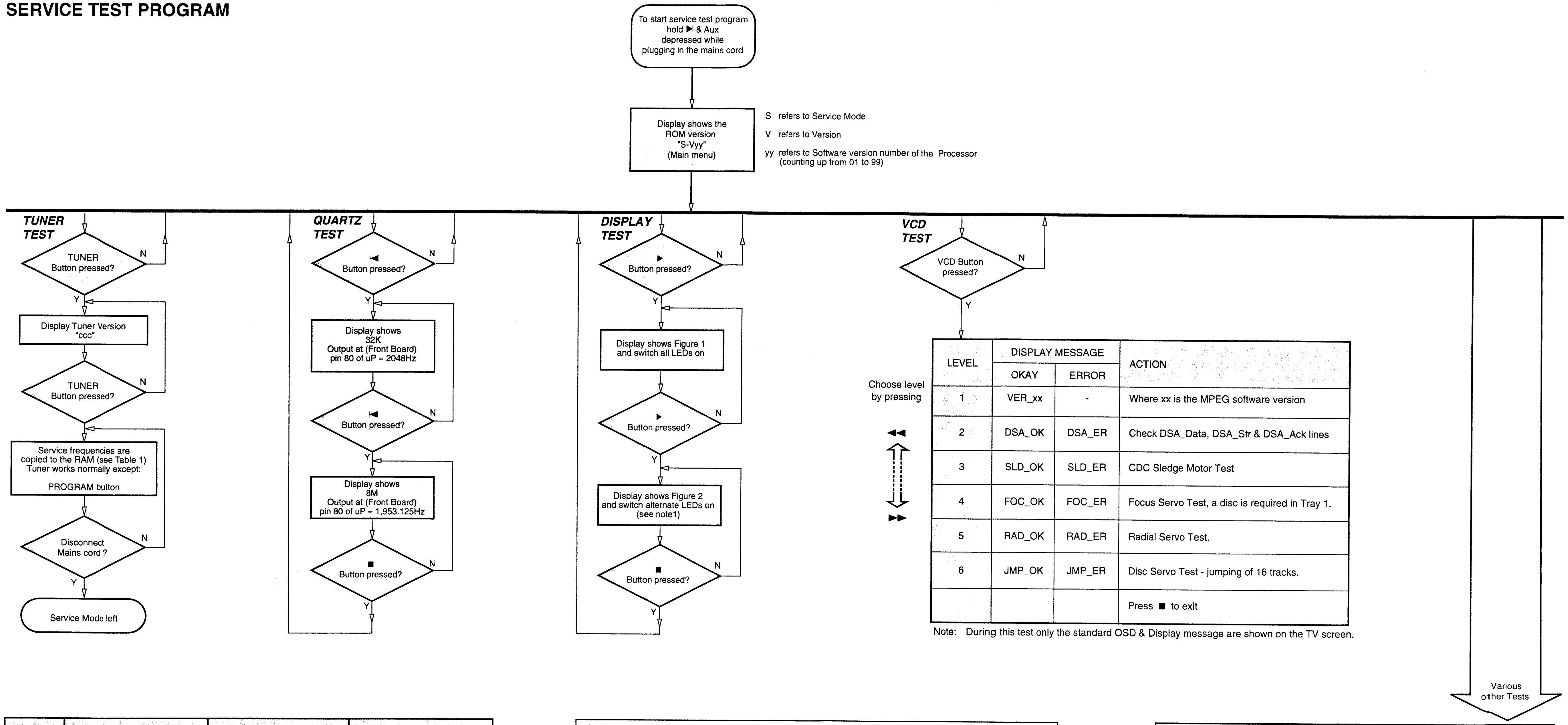
Service pos C



Use a insulation sheet to prevent the AF board and ETF board from being damaged or short-circuit to any metal parts.

Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex connectors before encasing, otherwise faults may occurs.

SERVICE TEST PROGRAM


To start service test program hold ▶I & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
TUNER TEST
TUNER Button pressed?
N
Y
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table 1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
I◀ Button pressed?
Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz
I◀ Button pressed?
Display shows 8M Output at (Front Board) pin 80 of uP = 1,953.125Hz
■ Button pressed?
DISPLAY TEST
▶ Button pressed?
Display shows Figure 1 and switch all LEDs on
▶ Button pressed?
Display shows Figure 2 and switch alternate LEDs on (see note1)
■ Button pressed?
VCD TEST
VCD Button pressed?
Various other Tests

S refers to Service Mode
V refers to Version
yy refers to Software version number of the Processor (counting up from 01 to 99)

Choose level by pressing ◀◀ ⇕ ▶▶

LEVEL	DISPLAY MESSAGE		ACTION
	OKAY	ERROR	
1	VER_xx	-	Where xx is the MPEG software version
2	DSA_OK	DSA_ER	Check DSA_Data, DSA_Str & DSA_Ack lines
3	SLD_OK	SLD_ER	CDC Sledge Motor Test
4	FOC_OK	FOC_ER	Focus Servo Test, a disc is required in Tray 1.
5	RAD_OK	RAD_ER	Radial Servo Test.
6	JMP_OK	JMP_ER	Disc Servo Test - jumping of 16 tracks.
			Press ■ to exit

Note: During this test only the standard OSD & Display message are shown on the TV screen.

PRESET	Europe "EUR"	USA "USA"	Overseas "OSE"
1	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz
3	531kHz	530kHz	531/530kHz*
4	1602kHz	1700kHz	1602/1700kHz*
5	558kHz	560kHz	558/560kHz*
6	1494kHz	1500kHz	1494/1500kHz*
7	153kHz	98MHz	98MHz
8	279kHz	87.5MHz	87.5MHz
9	198kHz	87.5MHz	87.5MHz
10	98MHz	87.5MHz	87.5MHz
11	87.5MHz	87.5MHz	87.5MHz

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz).
By holding the TUNER and ▶▶ buttons depressed while switching on the Mains supply, the tuning grid frequency is toggled between 9kHz and 10kHz for the Overseas (/21) version.

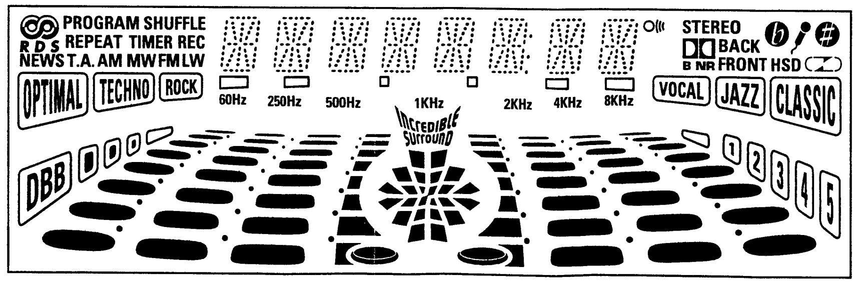
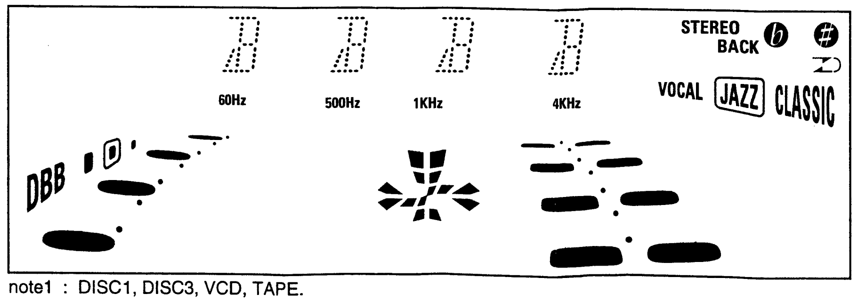

PROGRAM SHUFFLE
RDS REPEAT TIMER REC
NEWS T.A. AM MW FM LW
STEREO
BACK
NR FRONT HSD
OPTIMAL
TECHNO
ROCK
60Hz
250Hz
500Hz
1KHz
2KHz
4KHz
8KHz
VOCAL
JAZZ
CLASSIC
INCREDIBLE SURROUND
DBB
1
2
3
4
5

Figure 1

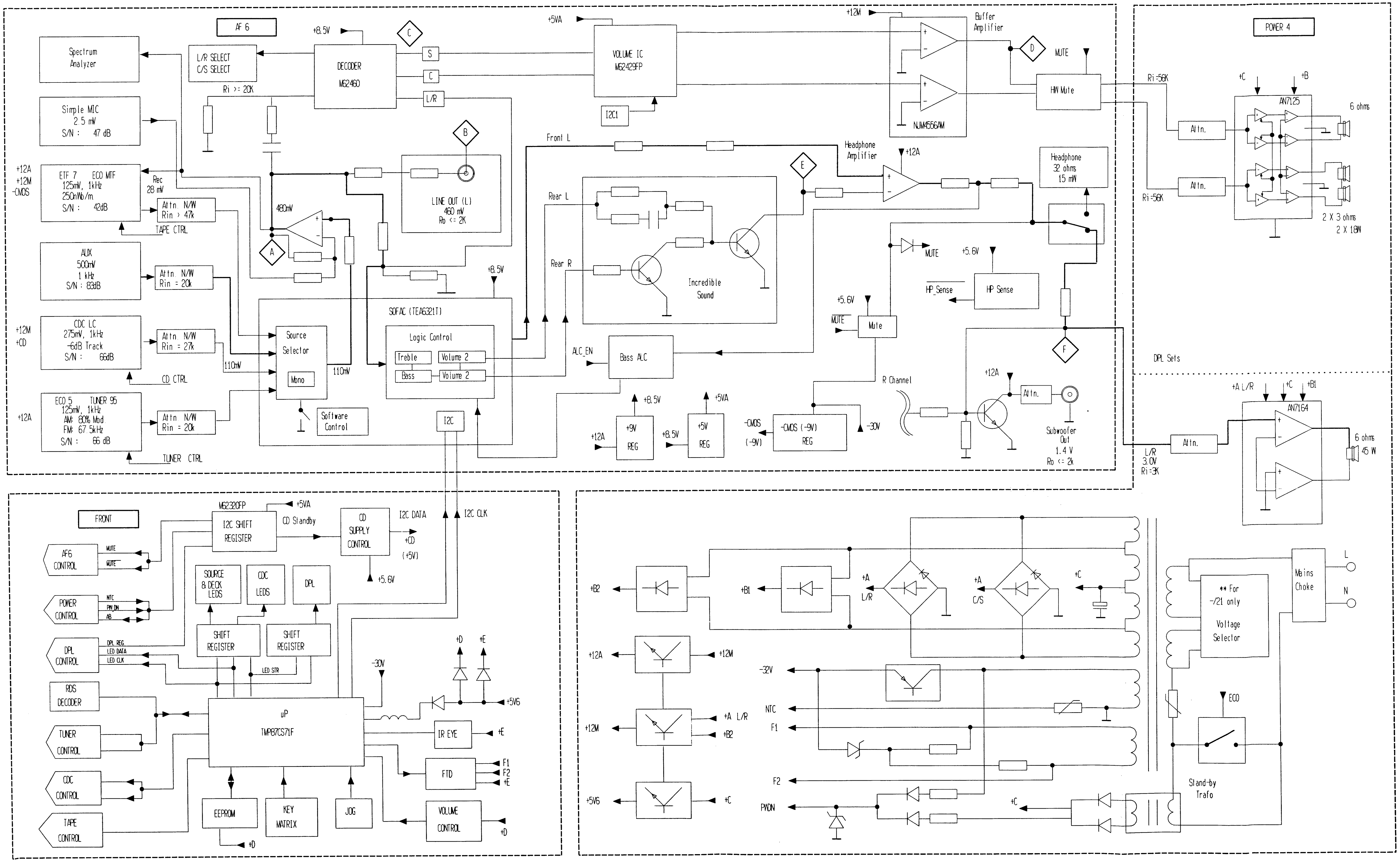

STEREO
BACK
60Hz
500Hz
1KHz
4KHz
VOCAL
JAZZ
CLASSIC
DBB

note1 : DISC1, DISC3, VCD, TAPE.

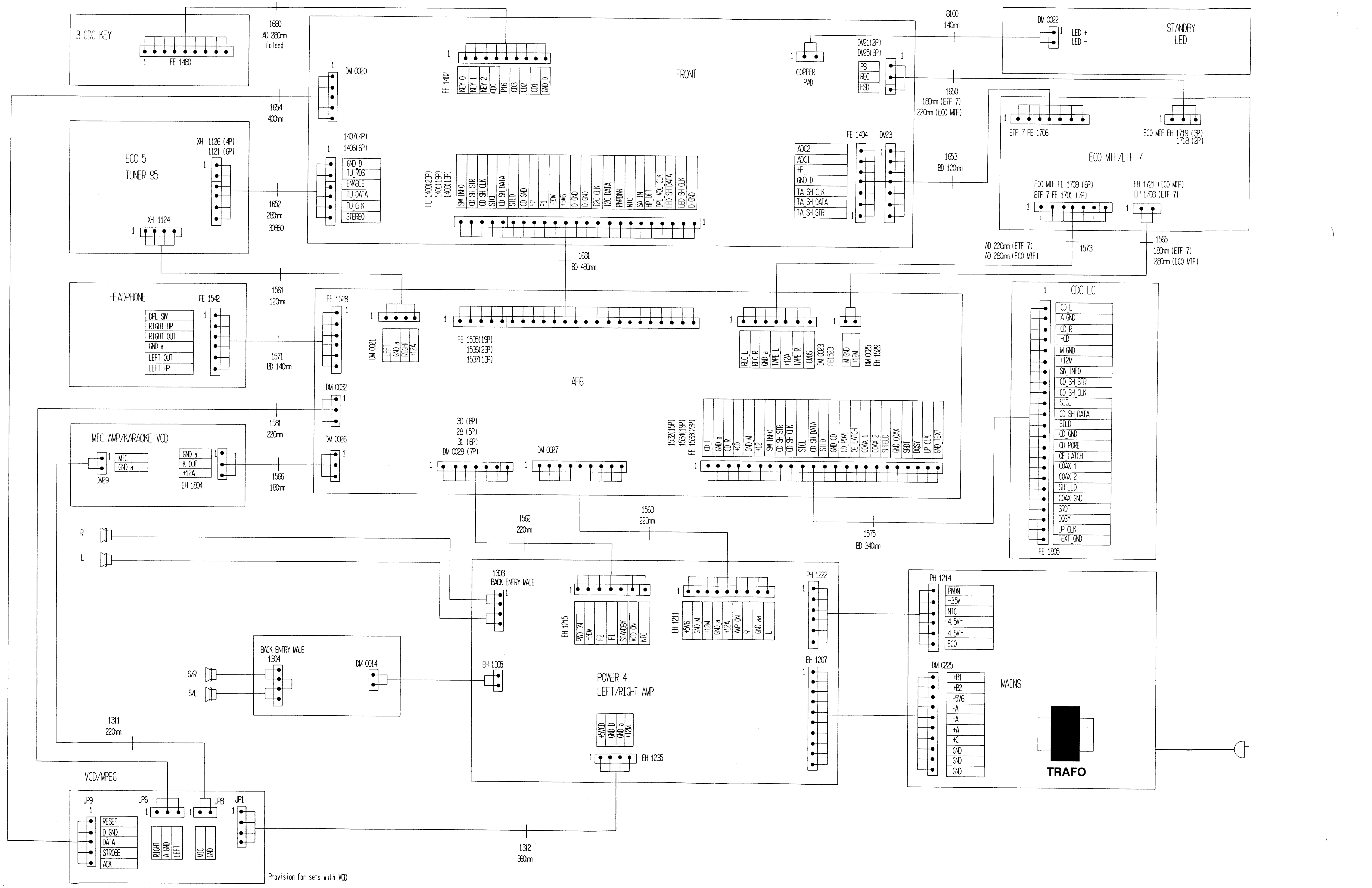
Figure 2

TEST	*Activated with*	*ACTION*
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ROTARY ENCODER TEST	Rotary Volume Knob or Jog Shuttle Knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	

SET BLOCK DIAGRAM


AF 6
Spectrum Analyzer
L/R SELECT
C/S SELECT
+8.5V
DECODER
M62460
C
S
C
L/R
Ri >= 20K
+5VA
VOLUME IC
M62429FP
I2C1
+12M
Buffer Amplifier
NJM4556AM
D
MUTE
HW Mute
Simple MIC
2.5 mV
S/N : 47 dB
+12A
+12M
-CMOS
ETF 7 ECO MTF
125mV, 1kHz
250nWb/m
S/N : 42dB
Rec
28 mV
Attn. N/W
Rin > 47k
TAPE CTRL
B
LINE OUT (L)
460 mV
Ro <= 2K
480mV
A
AUX
500mV
1 kHz
S/N : 83dB
Attn. N/W
Rin = 20k
+12M
+CD
CDC LC
275mV, 1kHz
-6dB Track
S/N : 66dB
Attn. N/W
Rin = 27k
CD CTRL
110mV
+12A
ECO 5 TUNER 95
125mV, 1kHz
AM: 80% Mod
FM: 67.5kHz
S/N : 66 dB
Attn. N/W
Rin = 20k
TUNER CTRL
SOFAC (TEA6321T)
Source Selector
Mono
Software Control
110mV
Logic Control
Treble
Volume 2
Bass
Volume 2
I2C
+8.5V
Front L
Rear L
Rear R
Incredible Sound
E
Headphone Amplifier
+12A
Headphone
32 ohms
15 mW
ALC_EN
Bass ALC
MUTE
+5.6V
HP_Sense
HP Sense
+5.6V
MUTE
Mute
R Channel
F
+12A
Attn.
Subwoofer Out
1.4 V
Ro <= 2k
+8.5V
+5VA
+12A
+9V REG
+8.5V
+5V REG
-CMOS
(-9V)
-CMOS (-9V) REG
-30V
POWER 4
Ri=56K
+C
+B
AN7125
6 ohms
Attn.
Attn.
Ri=56K
2 X 3 ohms
2 X 18W
DPL Sets
+A L/R
+C
+B1
AN7164
Attn.
L/R
3.0V
Ri=3K
6 ohms
45 W
FRONT
M62320FP
+5VA
I2C SHIFT REGISTER
CD Standby
CD SUPPLY CONTROL
I2C DATA
+CD
(+5V)
+5.6V
I2C CLK
AF6 CONTROL
MUTE
MUTE
POWER CONTROL
NTC
PW_DN
AB
DPL CONTROL
DPL REG.
LED DATA
LED CLK
SOURCE & DECK LEDS
CDC LEDS
DPL
SHIFT REGISTER
SHIFT REGISTER
LED STR
-30V
+D
+E
+5V6
RDS DECODER
TUNER CONTROL
CDC CONTROL
TAPE CONTROL
uP
TMP87CS71F
IR EYE
+E
FTD
F1
F2
+E
EEPROM
+D
KEY MATRIX
JOG
VOLUME CONTROL
+D
+B2
+B1
+A
L/R
+A
C/S
+C
+12A
+12M
+12M
+A L/R
+B2
+5V6
+C
-32V
NTC
F1
F2
PWDN
+C
** For
-/21 only
Voltage Selector
Mains Choke
L
N
ECO
Stand-by Trafo

SET WIRING DIAGRAM


3 CDC KEY
FE 1480
1680
AD 280mm
folded
DM 0020
FE 1402
KEY 0
KEY 1
KEY 2
CDC
P16
CD3
CD2
CD1
GND D
FRONT
COPPER
PAD
DM21(2P)
DM25(3P)
PB
REC
HSD
8100
140mm
DM 0022
LED +
LED -
STANDBY
LED
1650
180mm (ETF 7)
220mm (ECO MTF)
ETF 7 FE 1706
ECO MTF EH 1719 (3P)
1718 (2P)
ECO MTF/ETF 7
ECO MTF FE 1709 (6P)
ETF 7 FE 1701 (7P)
EH 1721 (ECO MTF)
EH 1703 (ETF 7)
1654
400mm
ECO 5
TUNER 95
XH 1126 (4P)
1121 (6P)
XH 1124
1407(4P)
1406(6P)
GND D
TU_RDS
ENABLE
TU_DATA
TU_CLK
STEREO
1652
280mm
300/60
FE 1400(23P)
1401(19P)
1403(13P)
SW INFO
CD SH STR
CD SH CLK
SICL
CD SH DATA
SILD
CD GND
F2
F1
-30V
+5V6
D GND
D GND
I2C CLK
I2C DATA
PWRDWN
NTC
SA IN
HP DET
DPL VOL CLK
LED SH DATA
LED SH CLK
D GND
FE 1404
DM23
ADC2
ADC1
+F
GND D
TA SH CLK
TA SH DATA
TA_SH_STR
1653
BD 120mm
AD 220mm (ETF 7)
AD 280mm (ECO MTF)
1573
1565
180mm (ETF 7)
280mm (ECO MTF)
1681
BD 480mm
HEADPHONE
FE 1542
DPL SW
RIGHT HP
RIGHT OUT
GND a
LEFT OUT
LEFT HP
1561
120mm
1571
BD 140mm
FE 1528
DM 0021
LEFT
GND a
RIGHT
+12A
FE 1535(19P)
1536(23P)
1537(13P)
AF6
REC_L
REC_R
GND a
TAPE_L
+12A
TAPE_R
-CMOS
DM 0023
FE1523
M GND
+12M
DM 0025
EH 1529
DM 0032
1581
220mm
MIC AMP/KARAOKE VCD
MIC
GND a
DM29
GND a
K OUT
+12A
EH 1804
DM 0026
1566
180mm
30 (8P)
28 (5P)
31 (6P)
DM 0029 (7P)
DM 0027
1532(15P)
1534(19P)
FE 1533(23P)
CD_L
GND a
CD_R
+CD
GND M
+12
SW INFO
CD SH STR
CD SH CLK
SICL
CD SH DATA
SILD
GND CD
CD PORE
OE LATCH
COAX 1
COAX 2
SHIELD
GND COAX
SRDT
DOSY
UP CLK
GND TEXT
CDC LC
CD L
A GND
CD R
+CD
M GND
+12M
SW INFO
CD SH STR
CD SH CLK
SICL
CD SH DATA
SILD
CD GND
CD PORE
OE LATCH
COAX 1
COAX 2
SHIELD
COAX GND
SRDT
DOSY
UP CLK
TEXT GND
FE 1805
1575
BD 340mm
1562
220mm
1563
220mm
R
L
1303
BACK ENTRY MALE
EH 1215
PWD DN
-30V
F2
F1
STANDBY
VCD ON
NTC
EH 1211
+5V6
GND M
+12M
GND a
+12A
AMP ON
R
GND aa
L
PH 1222
EH 1207
PH 1214
PWDN
-35V
NTC
4.5V~
4.5V~
ECO
DM 0225
+B1
+B2
+5V6
+A
+A
+A
+C
GND
GND
GND
MAINS
TRAFO
BACK ENTRY MALE
1304
DM 0014
S/R
S/L
EH 1305
POWER 4
LEFT/RIGHT AMP
+5VCD
GND D
GND a
+12M
EH 1235
1311
220mm
VCD/MPEG
JP9
JP6
JP8
JP1
RESET
D GND
DATA
STROBE
ACK
RIGHT
A GND
LEFT
MIC
GND
1312
360mm
Provision for sets with VCD

FRONT BOARD

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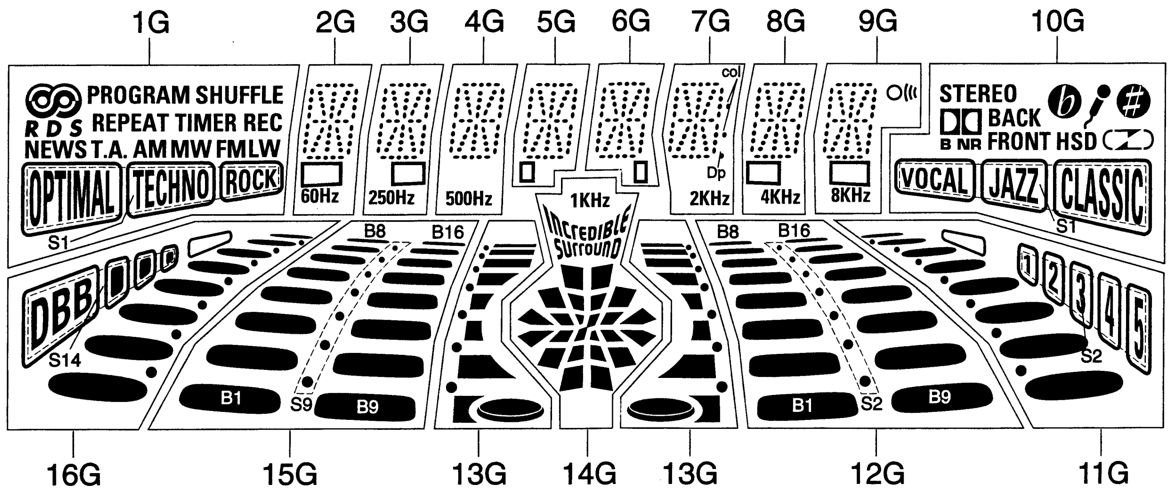
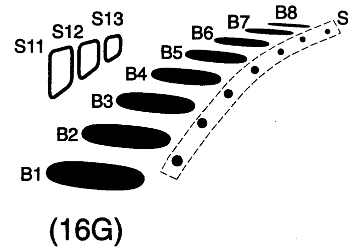
Electrical parts list... 6-6

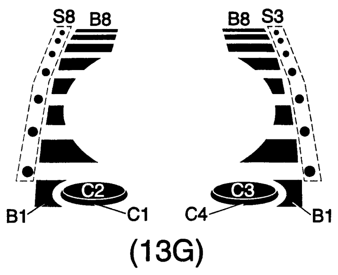
FTD DISPLAY PIN CONNECTIONS



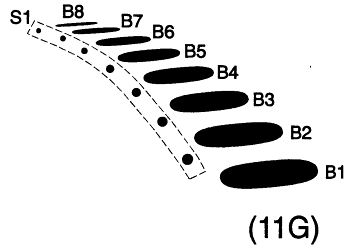
1G
2G
3G
4G
5G
6G
7G
8G
9G
10G
RDS
PROGRAM SHUFFLE
REPEAT TIMER REC
NEWS T.A. AM MW FM LW
OPTIMAL
TECHNO
ROCK
60Hz
250Hz
500Hz
1KHz
col
Dp
2KHz
4KHz
8KHz
STEREO
B NR
BACK
FRONT HSD
VOCAL
JAZZ
CLASSIC
INCREDIBLE SURROUND
S1
S1
DBB
S14
S2
S9
S2
B8
B16
B8
B16
B1
B9
B1
B9
1
2
3
4
5
16G
15G
13G
14G
13G
12G
11G



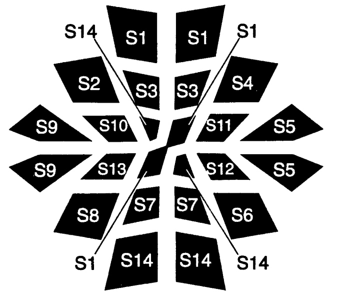
S11
S12
S13
B7
B8
S10
B6
B5
B4
B3
B2
B1
(16G)



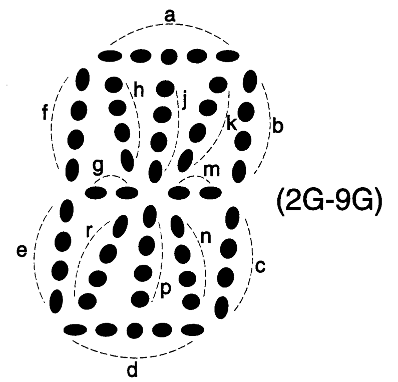
S8
B8
B8
S3
C2
C3
B1
C1
C4
B1
(13G)



S1
B8
B7
B6
B5
B4
B3
B2
B1
(11G)



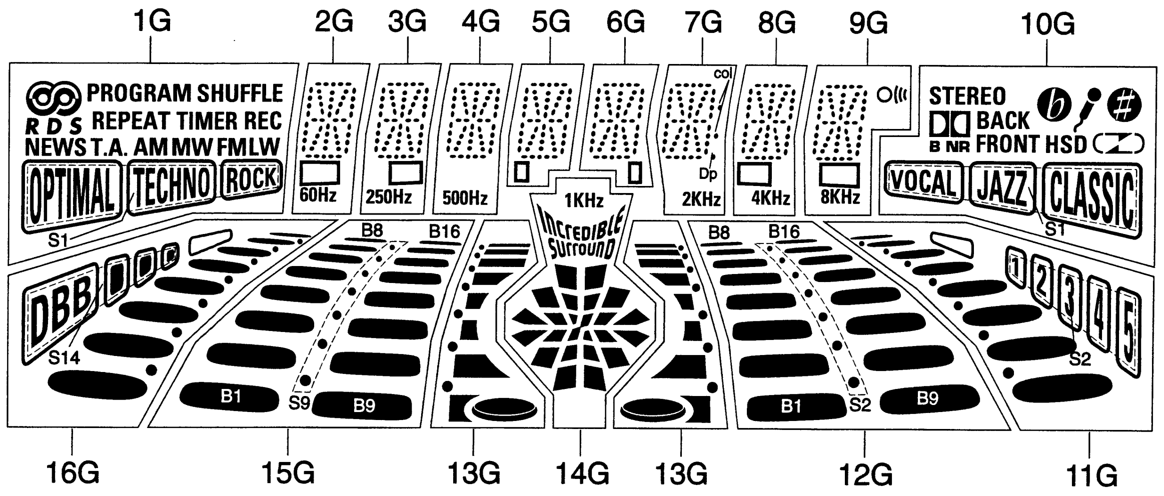
(14G)
S14
S1
S1
S1
S2
S3
S3
S4
S9
S10
S11
S5
S9
S13
S12
S5
S8
S7
S7
S6
S1
S14
S14
S14



a
f
h
j
k
b
g
m
e
r
n
c
p
d
(2G-9G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	15G	16G
P1	RDS	a	a	a	a	a	a	a	a	**STEREO**	B1	B1 , B9	B1	S1	B1 , B9	B1
P2	**NEWS**	h	h	h	h	h	h	h	h	B NR	B2	B2	B2	S2	B2	B2
P3	**T.A.**	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	**BACK**	B3	B3	B3	S3	B3	B3
P4	**PROGRAM**	k	k	k	k	k	k	k	k	**FRONT**	B4	B4	B4	S4	B4	B4
P5	**SHUFFLE**	b	b	b	b	b	b	b	b	b	B5	B5	B5	S5	B5	B5
P6	**REPEAT**	f	f	f	f	f	f	f	f	🎤	B6	B6	B6	S6	B6	B6
P7	**TIMER**	m	m	m	m	m	m	m	m	#	B7	B7	B7	S7	B7	B7
P8	**REC**	g	g	g	g	g	g	g	g	**HSD**	B8	B8	B8	S8	B8	B8
P9	**AM**	c	c	c	c	c	c	c	c	Ƶ	S1	S2	S3	S9	S9	S10
P10	**MW**	e	e	e	e	e	e	e	e	(	▱	B10	S8	S10	B10	▱
P11	**FM**	r	r	r	r	r	r	r	r	)	S2	B11	-	S11	B11	-
P12	**LW**	n	n	n	n	n	n	n	n	-	▯ (1)	B12	-	S12	B12	▱ (DBB)
P13	S1	d	d	d	d	d	d	d	d	S1	▯ (2)	B13	C1	S13	B13	S14
P14	▭ (OPTIMAL)	▭	▭	-	▯	▯	col	▭	▭	(VOCAL) ▭	▯ (3)	B14	C2	S14	B14	S11
P15	▭ (TECHNO)	**60Hz**	**250Hz**	**500Hz**	-	-	**2KHz**	**4KHz**	**8KHz**	(JAZZ) ▭	▯ (4)	B15	C3	**1KHz**	B15	S12
P16	▭ (ROCK)	-	-	-	-	-	Dp	-	O(((	(CLASSIC) ▭	▯ (5)	B16	C4	INCREDIBLE SURROUND	B16	S13

FTD DISPLAY PIN CONNECTIONS


1G
2G
3G
4G
5G
6G
7G
8G
9G
10G
PROGRAM SHUFFLE
RDS REPEAT TIMER REC
NEWS T.A. AM MW FM LW
OPTIMAL
TECHNO
ROCK
60Hz
250Hz
500Hz
1KHz
2KHz
4KHz
8KHz
col
Dp
STEREO
B NR
BACK
FRONT
HSD
VOCAL
JAZZ
CLASSIC
S1
B8
B16
INCREDIBLE SURROUND
B8
B16
S1
DBB
S14
B1
S9
B9
B1
S2
B9
1
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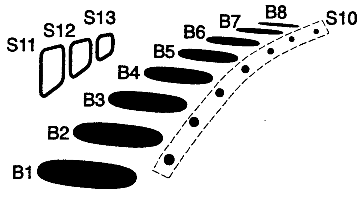
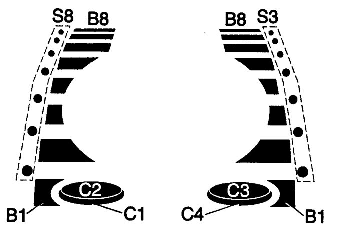
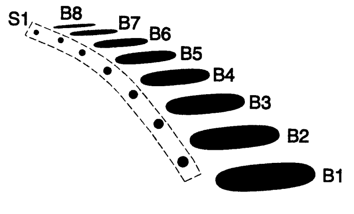
3
4
5
S2
16G
15G
13G
14G
13G
12G
11G


S11
S12
S13
B8
S10
B7
B6
B5
B4
B3
B2
B1

(16G)

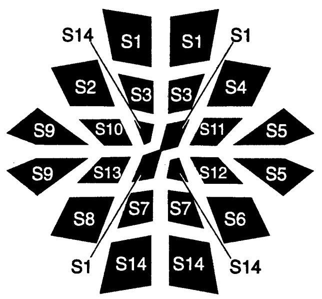

S8
B8
B8
S3
C2
C1
B1
C4
C3
B1

(13G)


S1
B8
B7
B6
B5
B4
B3
B2
B1

(11G)

(14G)


S14
S1
S1
S1
S2
S3
S3
S4
S9
S10
S11
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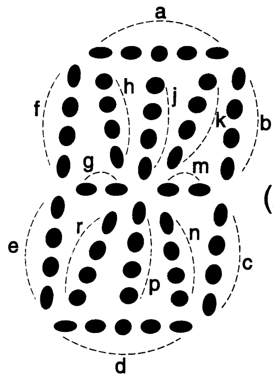
S13
S12
S5
S8
S7
S7
S6
S1
S14
S14
S14


a
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p
d

(2G-9G)

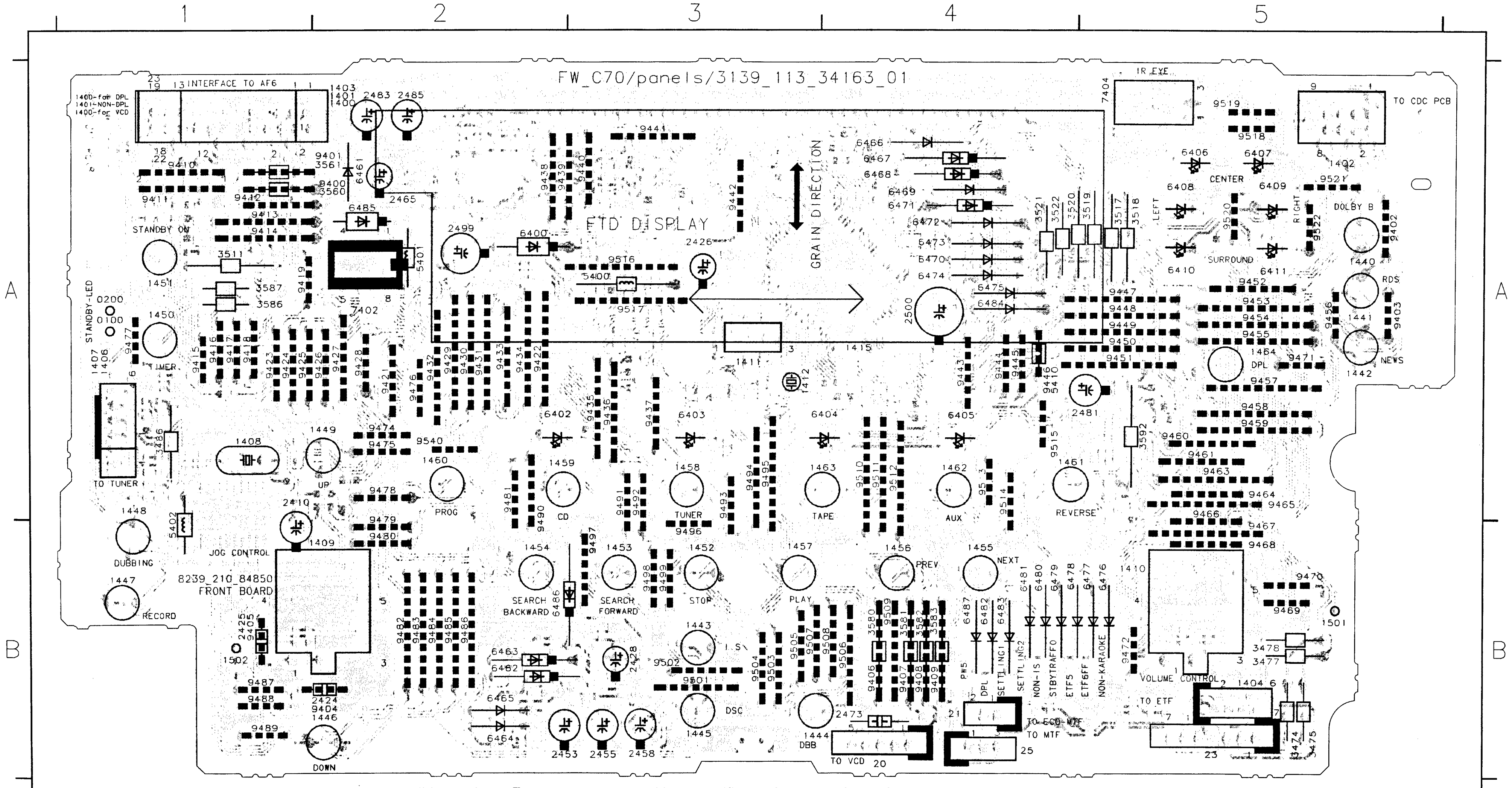
	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	15G	16G
P1	RDS	a	a	a	a	a	a	a	a	**STEREO**	B1	B1 , B9	B1	S1	B1 , B9	B1
P2	**NEWS**	h	h	h	h	h	h	h	h	B NR	B2	B2	B2	S2	B2	B2
P3	**T.A.**	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	**BACK**	B3	B3	B3	S3	B3	B3
P4	**PROGRAM**	k	k	k	k	k	k	k	k	**FRONT**	B4	B4	B4	S4	B4	B4
P5	**SHUFFLE**	b	b	b	b	b	b	b	b	b	B5	B5	B5	S5	B5	B5
P6	**REPEAT**	f	f	f	f	f	f	f	f	🎤	B6	B6	B6	S6	B6	B6
P7	**TIMER**	m	m	m	m	m	m	m	m	#	B7	B7	B7	S7	B7	B7
P8	**REC**	g	g	g	g	g	g	g	g	**HSD**	B8	B8	B8	S8	B8	B8
P9	**AM**	c	c	c	c	c	c	c	c	Z	S1	S2	S3	S9	S9	S10
P10	**MW**	e	e	e	e	e	e	e	e	(	▱	B10	S8	S10	B10	▱
P11	**FM**	r	r	r	r	r	r	r	r	)	S2	B11	-	S11	B11	-
P12	**LW**	n	n	n	n	n	n	n	n	-	▯ (1)	B12	-	S12	B12	▱ (DBB)
P13	S1	d	d	d	d	d	d	d	d	S1	▯ (2)	B13	C1	S13	B13	S14
P14	▭ (OPTIMAL)	▭	▭	-	▯	▯	col	▭	▭	(VOCAL) ▭	▯ (3)	B14	C2	S14	B14	S11
P15	▭ (TECHNO)	**60Hz**	**250Hz**	**500Hz**	-	-	**2KHz**	**4KHz**	**8KHz**	(JAZZ) ▭	▯ (4)	B15	C3	**1KHz**	B15	S12
P16	▭ (ROCK)	-	-	-	-	-	Dp	-	O(((	(CLASSIC) ▭	▯ (5)	B16	C4	INCREDIBLE SURROUND	B16	S13

NOTE :

FRONT BOARD - COMPONENT LAYOUT

20	B4	1408	A1	1447	B1	1460	A2	2455	B3	3486	A1	3583	B4	6406	A5	6468	A4	6481	B4
21	B4	1409	B2	1448	A1	1461	A4	2458	B3	3511	A1	3586	A1	6407	A5	6469	A4	6482	B4
23	B5	1410	B5	1449	A2	1462	A4	2465	A2	3517	A5	3587	A1	6408	A5	6470	A4	6483	B4
25	B4	1411	A3	1450	A1	1463	A4	2473	B4	3518	A5	3592	A5	6409	A5	6471	A4	6484	A4
0100	A1	1412	A3	1451	A1	1464	A5	2481	A5	3519	A5	5400	A3	6410	A5	6472	A4	6485	A2
0200	A1	1415	A4	1452	B3	1501	B5	2483	A2	3520	A4	5401	A2	6411	A5	6473	A4	6486	B2
1400	A2	1440	A5	1453	B3	1502	B1	2485	A2	3521	A4	5402	B1	6461	A2	6474	A4	6487	B4
1401	A2	1441	A5	1454	B2	2410	A1	2499	A2	3522	A4	5410	A4	6462	B2	6475	A4	7402	A2
1402	A5	1442	A5	1455	B4	2424	B2	2500	A4	3560	A2	6400	A2	6463	B2	6476	B5	7404	A5
1403	A2	1443	B3	1456	B4	2425	B1	3474	B5	3561	A2	6402	A2	6464	B2	6477	B5	9400	A2
1404	B5	1444	B3	1457	B3	2426	A3	3475	B5	3580	B4	6403	A3	6465	B2	6478	B4	9401	A2
1406	A1	1445	B3	1458	A3	2428	B3	3477	B5	3581	B4	6404	A4	6466	A4	6479	B4	9402	A5
1407	A1	1446	B2	1459	A2	2453	B2	3478	B5	3582	B4	6405	A4	6467	A4	6480	B4	9403	A5

9404	B2	9417	A1	9431	A2	9444	A4	9457	A5	9471	A5	9485	B2	9498	B3	9512	A4
9405	B1	9418	A1	9432	A2	9445	A4	9458	A5	9472	B5	9486	B2	9499	B3	9513	A4
9406	B4	9419	A1	9433	A2	9446	A4	9459	A5	9474	A2	9487	B1	9501	B3	9514	A4
9407	B4	9421	A2	9434	A2	9447	A5	9460	A5	9475	A2	9488	B1	9502	B3	9515	A4
9408	B4	9422	A2	9435	A3	9448	A5	9461	A5	9476	A2	9489	B1	9503	B3	9516	A3
9409	B4	9423	A1	9436	A3	9449	A5	9463	A5	9477	A1	9490	B2	9504	B3	9517	A3
9410	A1	9424	A1	9437	A3	9450	A5	9464	A5	9478	A2	9491	A3	9505	B3	9518	A5
9411	A1	9425	A1	9438	A2	9451	A5	9465	A5	9479	B2	9492	A3	9506	B4	9519	A5
9412	A1	9426	A2	9439	A2	9452	A5	9466	A5	9480	B2	9493	A3	9507	B3	9520	A5
9413	A1	9427	A2	9440	A3	9453	A5	9467	B5	9481	A2	9494	A3	9508	B4	9521	A5
9414	A1	9428	A2	9441	A3	9454	A5	9468	B5	9482	B2	9495	A3	9509	B4	9522	A5
9415	A1	9429	A2	9442	A3	9455	A5	9469	B5	9483	B2	9496	B3	9510	A4	9540	A2
9416	A1	9430	A2	9443	A4	9456	A5	9470	B5	9484	B2	9497	B3	9511	A4		


1
2
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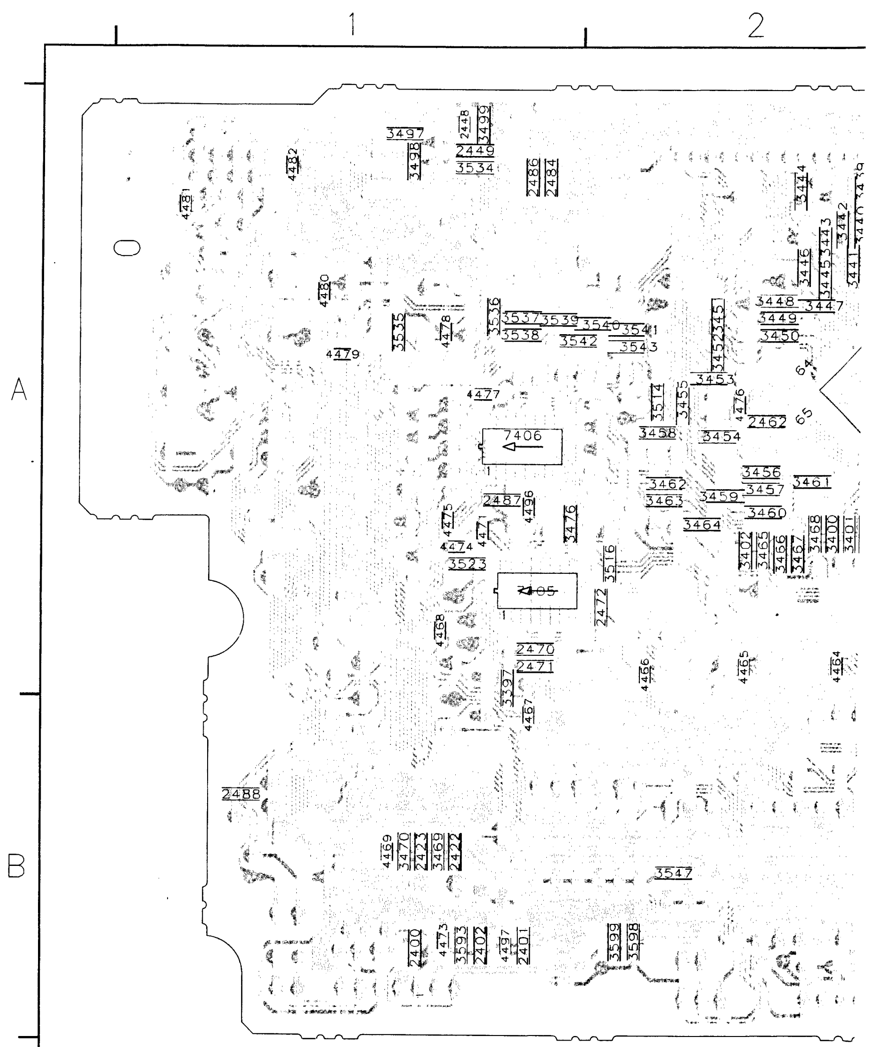
5
A
B
FW_C70/panels/3139_113_34163_01
INTERFACE TO AF6
IR EYE
TO CDC PCB
FTD DISPLAY
GRAIN DIRECTION
STANDBY ON
STANDBY-LED
TIMER
TO TUNER
UP
DUBBING
JOG CONTROL
RECORD
8239_210_84850
FRONT BOARD
DOWN
PROG
CD
TUNER
TAPE
AUX
REVERSE
SEARCH BACKWARD
SEARCH FORWARD
STOP
PLAY
PREV
NEXT
DSC
DBB
TO VCD
TO ECD-MTF
TO MTF
TO ETF
VOLUME CONTROL
CENTER
LEFT
RIGHT
SURROUND
DOLBY B
RDS
NEWS
DPL
SETTLING
NON-IS
STBYTRAFFO
ETFS
ETF6FF
NON-KARAOKE

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list. 3139 113 3416 pt3 dd wk0016

FRONT BOARD - CHIP LAYOUT

2400	B1	2418	A3	2442	A4	2470	A1	3401	A2	3418	A3	3435	A2	3452	A2
2401	B1	2419	A3	2445	A4	2471	A1	3402	A2	3419	A3	3436	A2	3453	A2
2402	B1	2420	A3	2446	A5	2472	A2	3403	A2	3420	A3	3437	A2	3454	A2
2403	A5	2421	A3	2447	A5	2475	A5	3404	A2	3421	A3	3438	A2	3455	A2
2404	A5	2422	B1	2448	A1	2482	A3	3405	A3	3422	A3	3439	A2	3456	A2
2405	A5	2423	B1	2449	A1	2484	A1	3406	A3	3423	A3	3440	A2	3457	A2
2406	A5	2431	A3	2450	A3	2486	A1	3407	A3	3424	A3	3441	A2	3458	A2
2407	A5	2432	A3	2451	A3	2487	A1	3408	A3	3425	A3	3442	A2	3459	A2
2408	B5	2433	A3	2452	A3	2488	B1	3409	A3	3426	A3	3443	A2	3460	A2
2409	B5	2434	A3	2454	B4	2489	B5	3410	A3	3427	A3	3444	A2	3461	A2
2411	A5	2435	A3	2456	B4	2502	B3	3411	A3	3428	A3	3445	A2	3462	A2
2412	A5	2436	A3	2457	B4	2504	B3	3412	A3	3429	A3	3446	A2	3463	A2
2413	A5	2437	A4	2459	B4	2505	B3	3413	A3	3430	A3	3447	A2	3464	A2
2414	A5	2438	A4	2460	B4	2506	A5	3414	A3	3431	A3	3448	A2	3465	A2
2415	A5	2439	A4	2462	A2	2507	A5	3415	A3	3432	A3	3449	A2	3466	A2
2416	A5	2440	A4	2463	A5	3397	A1	3416	A3	3433	A3	3450	A2	3467	A2
2417	A3	2441	A4	2464	A5	3400	A2	3417	A3	3434	A3	3451	A2	3468	A2


1
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A
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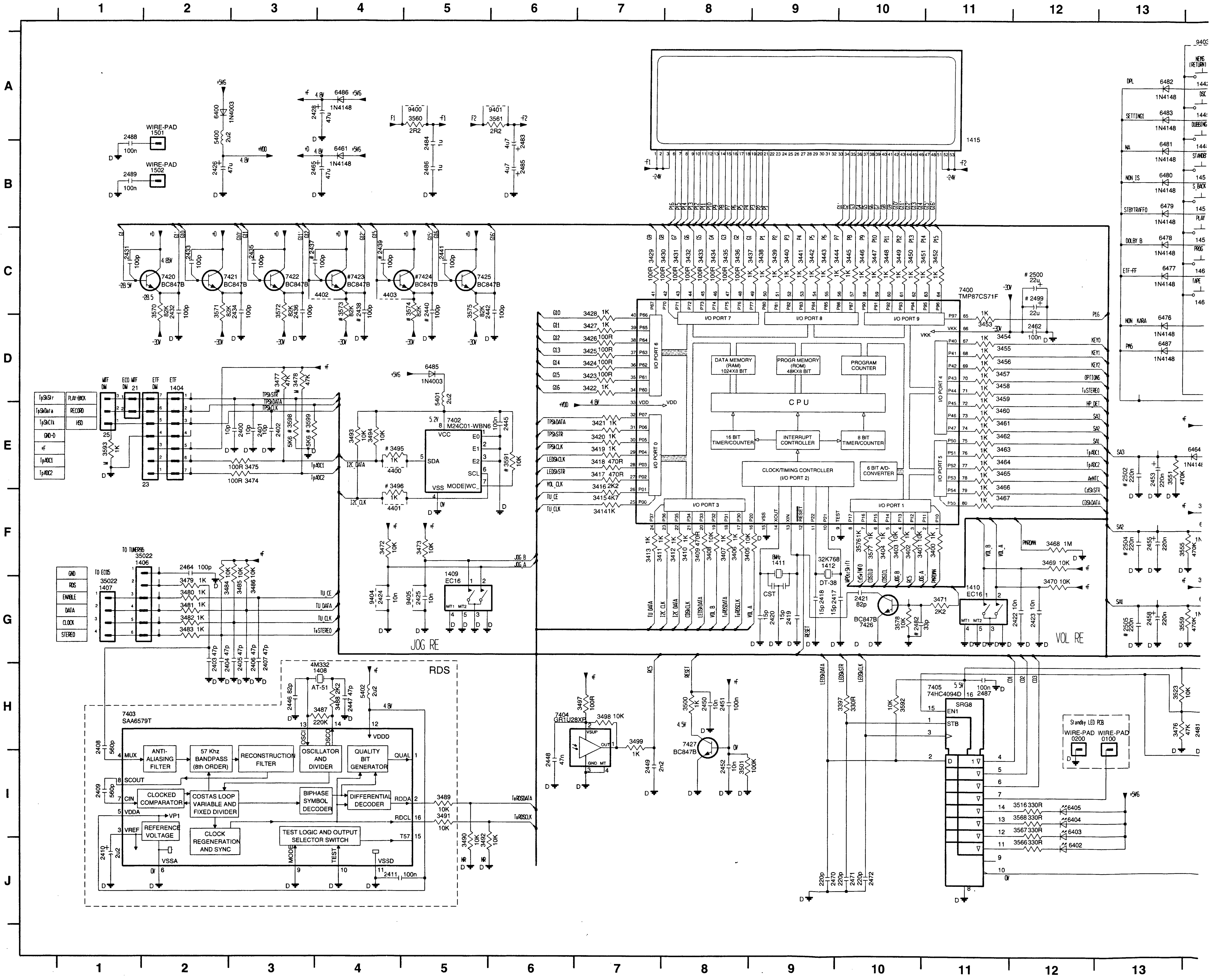
7406
7405

This assembly drawing shows a summary of all possible versions. For components u

FRONT BOARD - CIRCUIT DIAGRAM

20 A20	1402 G20	1411 F9	1445 A14	1453 B14	1461 C15	2402 E3	2410 J1	2418 G9	2426 B2	2437 C3	2447 H4	2455 F13	2464 F2	2482 G10	2499 C12	3400 F11	3408 F8	3416 E7	3424 D7	3432 C8	3440 C9	3448 C10	3456 D11	3464 E11	3472 F4	3480 G2	3488 H4	3496 E4	3505 A18	3516 I12	3534 A15
21 D1	1403 D19	1412 F9	1446 B15	1454 B14	1462 C14	2403 G2	2411 J4	2419 G9	2428 A3	2438 C4	2448 I6	2456 F14	2465 B3	2483 B6	2500 C12	3401 F10	3409 F8	3417 E7	3425 D7	3433 C8	3441 C9	3449 C10	3457 D11	3465 E11	3473 F5	3481 G2	3489 I5	3497 H7	3507 A18	3517 H16	3535 A15
23 E2	1404 D2	1415 B11	1447 B14	1455 C15	1463 C14	2404 G2	2412 B17	2420 G9	2431 C1	2439 C4	2449 I7	2457 F14	2470 J9	2484 B5	2502 E13	3402 F10	3410 F8	3418 E7	3426 D7	3434 C8	3442 C9	3450 C10	3458 D11	3466 E11	3474 E3	3482 G2	3490 J5	3498 H7	3509 C18	3518 I16	3536 A15
25 E1	1406 F1	1440 A15	1448 B14	1456 C14	1464 D15	2405 G3	2413 B17	2421 G10	2432 C2	2440 C5	2450 H8	2458 G13	2471 J10	2485 B6	2504 F13	3403 F10	3411 F7	3419 E7	3427 D7	3435 C8	3443 C9	3451 C11	3459 D11	3467 F11	3475 E3	3483 G2	3491 I5	3499 H7	3510 C18	3519 I16	3537 B15
0100 H13	1407 G1	1441 A14	1449 B15	1457 C14	1501 A2	2406 G3	2414 B17	2422 G12	2433 C2	2441 C5	2451 H8	2459 G14	2472 J10	2486 B5	2505 G13	3404 F10	3412 F8	3420 E7	3428 C7	3436 C8	3444 C10	3452 C11	3460 E11	3468 F12	3476 H13	3484 G2	3492 J5	3500 H8	3511 C17	3520 I16	3538 B15
0200 H12	1408 H4	1442 A14	1450 B14	1458 C15	1502 B2	2407 G3	2415 C17	2423 G12	2434 C3	2442 C6	2452 I8	2460 G14	2473 A20	2487 H11	2506 A17	3405 F8	3413 F7	3421 E7	3429 C7	3437 C9	3445 C10	3453 D11	3461 E11	3469 F12	3477 D3	3485 G3	3493 E4	3501 I8	3512 D18	3521 I16	3539 B15
1400 D18	1409 G5	1443 A15	1451 B14	1459 C14	2400 E3	2408 H1	2416 C17	2424 G4	2435 C3	2445 E6	2453 E13	2462 D12	2475 B17	2488 A1	2507 A17	3406 F8	3414 F7	3422 D7	3430 C8	3438 C9	3446 C10	3454 D11	3462 E11	3470 G12	3478 D3	3486 G3	3494 E4	3503 A18	3513 D18	3522 I16	3540 C15
1401 D19	1410 G11	1444 A14	1452 B15	1460 C14	2401 E3	2409 I1	2417 G10	2425 G5	2436 C3	2446 H3	2454 E14	2463 B18	2481 H14	2489 B1	3397 H10	3407 F8	3415 F7	3423 D7	3431 C8	3439 C9	3447 C10	3455 D11	3463 E11	3471 G11	3479 G2	3487 H4	3495 E4	3504 A18	3514 G20	3523 H13	3541 C15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A
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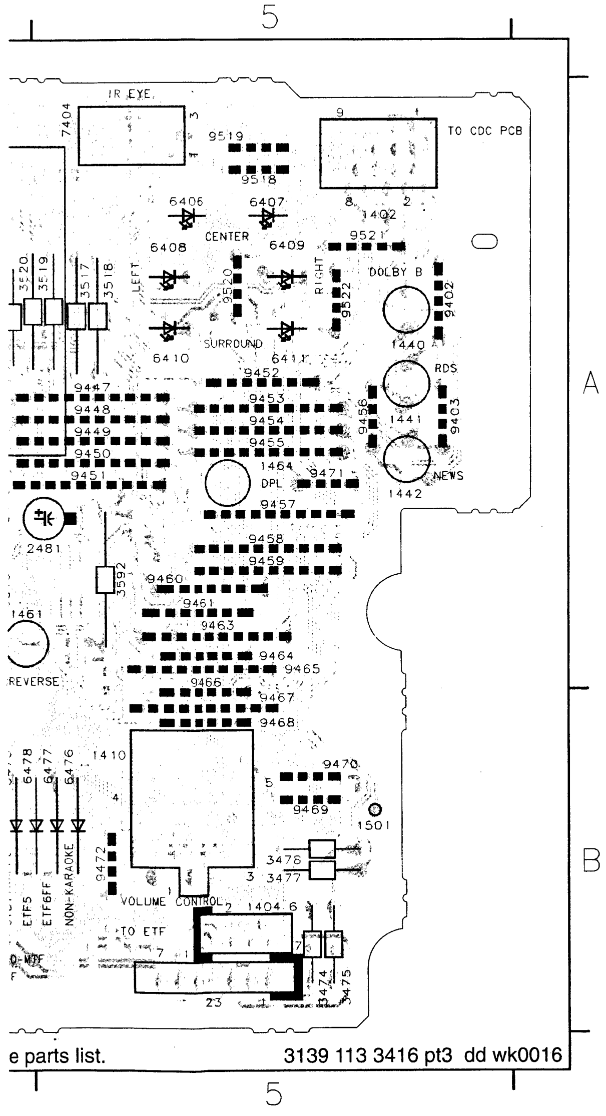
I
J
WIRE-PAD 1501
WIRE-PAD 1502
1415
7400 TMP87CS71F
I/O PORT 7
I/O PORT 8
I/O PORT 9
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
I/O PORT 3
I/O PORT 1
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
7402 M24C01-WBN6
JOG RE
VOL RE
1409 EC16
1410 EC16
TO TUNER95 35022 1406
TO ECO35 35022 1407
RDS
7403 SAA6579T
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
7404 GP1U28XP
7427 BC847B
7426 BC847B
7405 74HC4094D
SRG8
Standby LED PCB
WIRE-PAD 0200
WIRE-PAD 0100
7420 BC847B
7421 BC847B
7422 BC847B
7423 BC847B
7424 BC847B
7425 BC847B

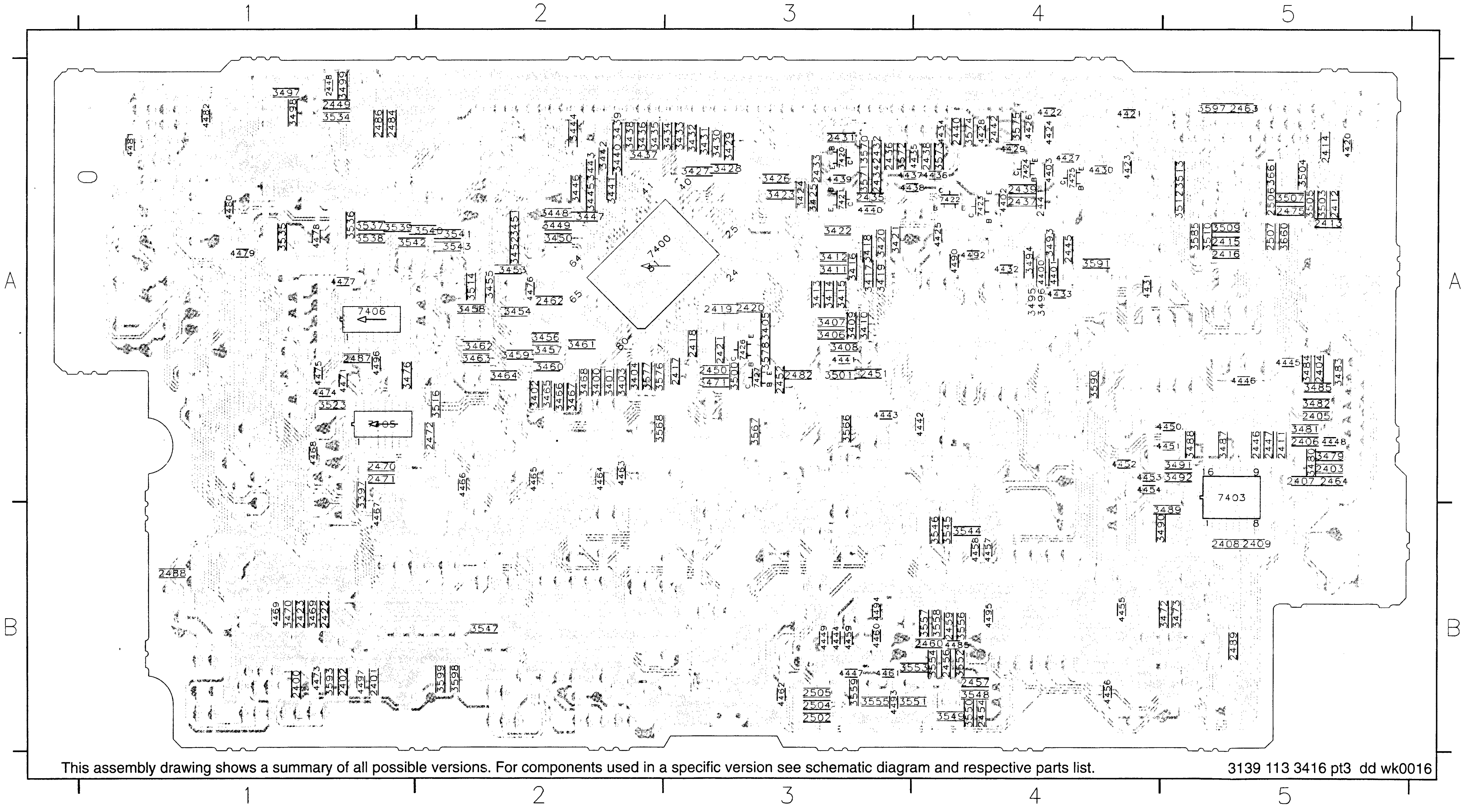
4 A4	9457 A5	9471 A5	9485 B2	9498 B3	9512 A4
5 A4	9458 A5	9472 B5	9486 B2	9499 B3	9513 A4
6 A4	9459 A5	9474 A2	9487 B1	9501 B3	9514 A4
7 A5	9460 A5	9475 A2	9488 B1	9502 B3	9515 A4
8 A5	9461 A5	9476 A2	9489 B1	9503 B3	9516 A3
9 A5	9463 A5	9477 A1	9490 B2	9504 B3	9517 A3
0 A5	9464 A5	9478 A2	9491 A3	9505 B3	9518 A5
1 A5	9465 A5	9479 B2	9492 A3	9506 B4	9519 A5
2 A5	9466 A5	9480 B2	9493 A3	9507 B3	9520 A5
3 A5	9467 B5	9481 A2	9494 A3	9508 B4	9521 A5
4 A5	9468 B5	9482 B2	9495 A3	9509 B4	9522 A5
5 A5	9469 B5	9483 B2	9496 B3	9510 A4	9540 A2
6 A3	9470 B5	9484 B2	9497 B3	9511 A4	



e parts list.

FRONT BOARD - CHIP LAYOUT

2400 B1	2418 A3	2442 A4	2470 A1	3401 A2	3418 A3	3435 A2	3452 A2	3469 B1	3491 A5	3512 A5	3546 B4	3570 A3	3661 A5	4432 A4	4449 B3	4466 A2	4492 A4	7427 A3
2401 B1	2419 A3	2445 A4	2471 A1	3402 A2	3419 A3	3436 A2	3453 A2	3470 B1	3492 A5	3513 A5	3547 B2	3571 A3	4400 A4	4433 A4	4450 A5	4467 B1	4493 B3	
2402 B1	2420 A3	2446 A5	2472 A2	3403 A2	3420 A3	3437 A2	3454 A2	3471 A3	3493 A4	3514 A2	3548 B4	3572 A3	4401 A4	4434 A4	4451 A5	4468 A1	4494 B3	
2403 A5	2421 A3	2447 A5	2475 A5	3404 A2	3421 A3	3438 A2	3455 A2	3472 B5	3494 A4	3516 A2	3549 B4	3573 A4	4402 A4	4435 A4	4452 A4	4469 B1	4495 B4	
2404 A5	2422 B1	2448 A1	2482 A3	3405 A3	3422 A3	3439 A2	3456 A2	3473 B5	3495 A4	3523 A1	3550 B4	3574 A4	4403 A4	4436 A4	4453 A4	4471 A1	4496 A1	
2405 A5	2423 B1	2449 A1	2484 A1	3406 A3	3423 A3	3440 A2	3457 A2	3476 A1	3496 A4	3534 A1	3551 B4	3575 A4	4420 A5	4437 A3	4454 A4	4473 B1	4497 B1	
2406 A5	2431 A3	2450 A3	2486 A1	3407 A3	3424 A3	3441 A2	3458 A2	3479 A5	3497 A1	3535 A1	3552 B4	3576 A2	4421 A4	4438 A4	4455 B4	4474 A1	7400 A2	
2407 A5	2432 A3	2451 A3	2487 A1	3408 A3	3425 A3	3442 A2	3459 A2	3480 A5	3498 A1	3536 A1	3553 B4	3577 A2	4422 A4	4439 A3	4456 B4	4475 A1	7403 A5	
2408 B5	2433 A3	2452 A3	2488 B1	3409 A3	3426 A3	3443 A2	3460 A2	3481 A5	3499 A1	3537 A1	3554 B4	3578 A3	4423 A4	4440 A3	4457 B4	4476 A2	7405 A1	
2409 B5	2434 A3	2454 B4	2489 B5	3410 A3	3427 A3	3444 A2	3461 A2	3482 A5	3500 A3	3538 A1	3555 B3	3585 A5	4424 A4	4441 A3	4458 B4	4477 A1	7406 A1	
2411 A5	2435 A3	2456 B4	2502 B3	3411 A3	3428 A3	3445 A2	3462 A2	3483 A5	3501 A3	3539 A1	3556 B4	3590 A4	4425 A4	4442 A4	4459 B3	4478 A1	7420 A3	
2412 A5	2436 A3	2457 B4	2504 B3	3412 A3	3429 A3	3446 A2	3463 A2	3484 A5	3503 A5	3540 A2	3557 B4	3591 A4	4426 A4	4443 A3	4460 B3	4479 A1	7421 A3	
2413 A5	2437 A4	2459 B4	2505 B3	3413 A3	3430 A3	3447 A2	3464 A2	3485 A5	3504 A5	3541 A2	3558 B4	3593 B1	4427 A4	4444 B3	4461 B3	4480 A1	7422 A4	
2414 A5	2438 A4	2460 B4	2506 A5	3414 A3	3431 A3	3448 A2	3465 A2	3487 A5	3505 A5	3542 A1	3559 B3	3597 A5	4428 A4	4445 A5	4462 B3	4481 A1	7423 A4	
2415 A5	2439 A4	2462 A2	2507 A5	3415 A3	3432 A3	3449 A2	3466 A2	3488 A5	3507 A5	3543 A2	3566 A3	3598 B2	4429 A4	4446 A5	4463 A2	4482 A1	7424 A4	
2416 A5	2440 A4	2463 A5	3397 A1	3416 A3	3433 A3	3450 A2	3467 A2	3489 B5	3509 A5	3544 B4	3567 A3	3599 B2	4430 A4	4447 B3	4464 A2	4485 B4	7425 A4	
2417 A3	2441 A4	2464 A5	3400 A2	3417 A3	3434 A3	3451 A2	3468 A2	3490 B5	3510 A5	3545 B4	3568 A2	3660 A5	4431 A4	4448 A5	4465 A2	4490 A4	7426 A3	



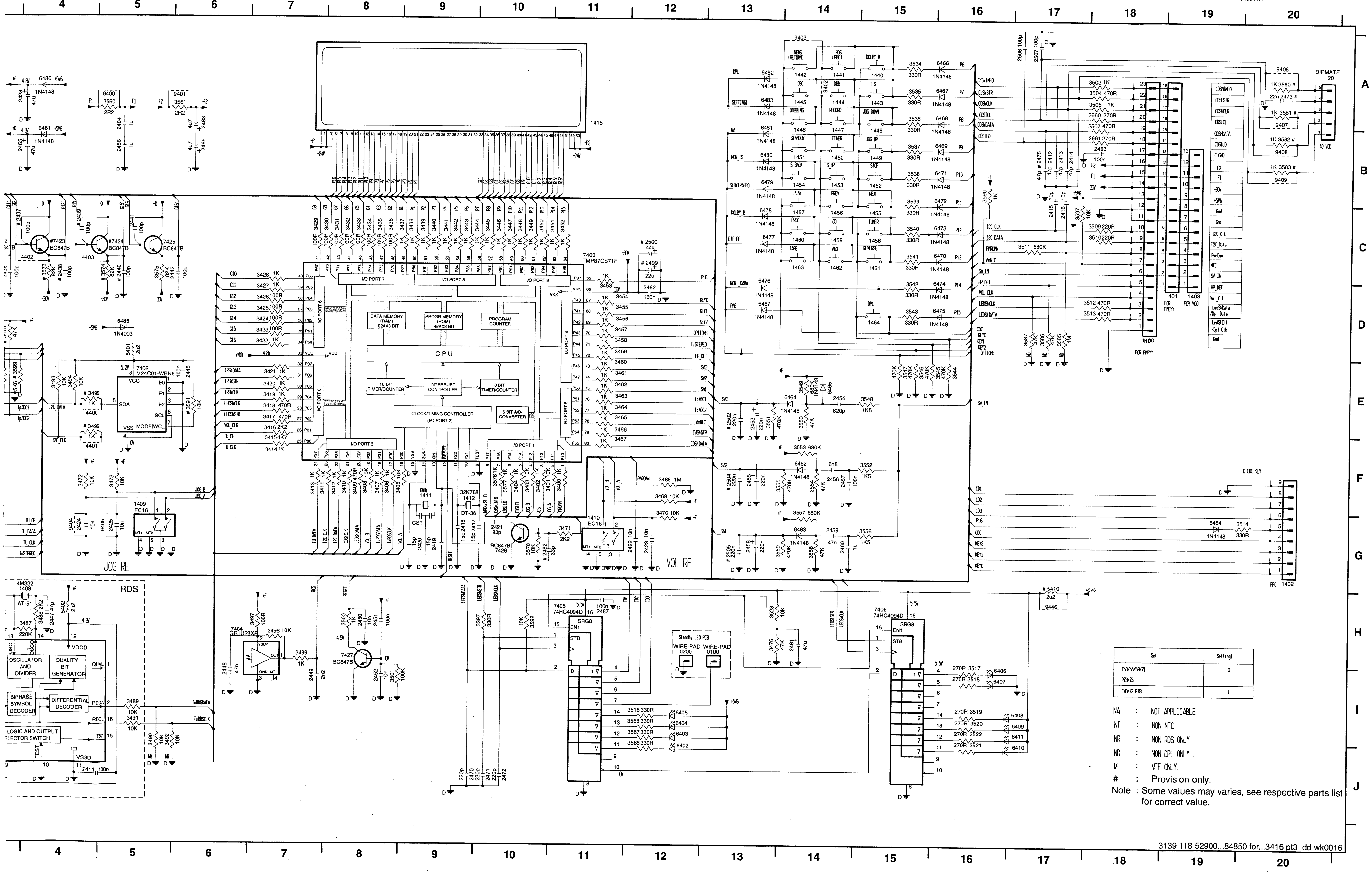
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

J1	2418 G9	2426 B2	2437 C3	2447 H4	2455 F13	2464 F2	2482 G10	2499 C12	3400 F11
J4	2419 G9	2428 A3	2438 C4	2448 I6	2456 F14	2465 B3	2483 B6	2500 C12	3401 F10
B17	2420 G9	2431 C1	2439 C4	2449 I7	2457 F14	2470 J9	2484 B5	2502 E13	3402 F10
B17	2421 G10	2432 C2	2440 C5	2450 H8	2458 G13	2471 J10	2485 B6	2504 F13	3403 F10
B17	2422 G12	2433 C2	2441 C5	2451 H8	2459 G14	2472 J10	2486 B5	2505 G13	3404 F10
C17	2423 G12	2434 C3	2442 C6	2452 I8	2460 G14	2473 A20	2487 H11	2506 A17	3405 F8
C17	2424 G4	2435 C3	2445 E6	2453 E13	2462 D12	2475 B17	2488 A1	2507 A17	3406 F8
G10	2425 G5	2436 C3	2446 H3	2454 E14	2463 B18	2481 H14	2489 B1	3397 H10	3407 F8

3408 F8	3416 E7	3424 D7	3432 C8	3440 C9	3448 C10	3456 D11	3464 E11	3472 F4	3480 G2
3409 F8	3417 E7	3425 D7	3433 C8	3441 C9	3449 C10	3457 D11	3465 E11	3473 F5	3481 G2
3410 F8	3418 E7	3426 D7	3434 C8	3442 C9	3450 C10	3458 D11	3466 E11	3474 E3	3482 G2
3411 F7	3419 E7	3427 D7	3435 C8	3443 C9	3451 C11	3459 D11	3467 F11	3475 E3	3483 G2
3412 F8	3420 E7	3428 C7	3436 C8	3444 C10	3452 C11	3460 E11	3468 F12	3476 H13	3484 G2
3413 F7	3421 E7	3429 C7	3437 C9	3445 C10	3453 D11	3461 E11	3469 F12	3477 D3	3485 G3
3414 F7	3422 D7	3430 C8	3438 C9	3446 C10	3454 D11	3462 E11	3470 G12	3478 D3	3486 G3
3415 F7	3423 D7	3431 C8	3439 C9	3447 C10	3455 D11	3463 E11	3471 G11	3479 G2	3487 H4

3488 H4	3496 E4	3505 A18	3516 I12	3534 A15	3542 D15	3550 E14	3558 G14	3571 C2	3580 A20
3489 I5	3497 H7	3507 A18	3517 H16	3535 A15	3543 D15	3551 E13	3559 G14	3572 C3	3581 A20
3490 J5	3498 H7	3509 C18	3518 I16	3536 A15	3544 E16	3552 F15	3560 A5	3573 C4	3582 B20
3491 I5	3499 H7	3510 C18	3519 I16	3537 B15	3545 E16	3553 F14	3561 A6	3574 C5	3583 B20
3492 J5	3500 H8	3511 C17	3520 I16	3538 B15	3546 E15	3554 F14	3566 J12	3575 C5	3585 D17
3493 E4	3501 I8	3512 D18	3521 I16	3539 B15	3547 E15	3555 F14	3567 I12	3576 F10	3586 D17
3494 E4	3503 A18	3513 D18	3522 I16	3540 C15	3548 E15	3556 G15	3568 I12	3577 F10	3587 D17
3495 E4	3504 A18	3514 G20	3523 H13	3541 C15	3549 E14	3557 F14	3570 C2	3578 G10	3590 B16

3591 E6	4400 E4	6400 A2	6409 I17	6466 A16	6474 D16	6482 A13	7403 H1	7424 C5	9404 G4
3592 H10	4401 F4	6402 J12	6410 J17	6467 A16	6475 D16	6483 A13	7404 H6	7425 C5	9405 G5
3593 E1	4402 C4	6403 I12	6411 I17	6468 A16	6476 D13	6484 G19	7405 H11	7426 G10	9406 A20
3597 C17	4403 C4	6404 I12	6461 B4	6469 B16	6477 C13	6485 D5	7406 H15	7427 H8	9407 A20
3598 E3	5400 A2	6405 I12	6462 F14	6470 C16	6478 C13	6486 A4	7420 C2	9400 A5	9408 B20
3599 E3	5401 D5	6406 I16	6463 G14	6471 B16	6479 B13	6487 D13	7421 C2	9401 A6	9409 B20
3660 A18	5402 H4	6407 I16	6464 E14	6472 B16	6480 B13	7400 C11	7422 C3	9402 A14	9446 H17
3661 B18	5410 H17	6408 I17	6465 E14	6473 C16	6481 B13	7402 E5	7423 C4	9403 A14	


4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J
1415
7400
TMP87CS71F
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 0
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
7402
M24C01-WBN6
7423 BC847B
7424 BC847B
7425 BC847B
1409 EC16
JOG RE
1410 EC16
VOL RE
1411 8MHz CST
1412 32K768 DT-38
7426 BC847B
7427 BC847B
7404 GP1U28XP
RDS
1408 4M332 AT-51
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
LOGIC AND OUTPUT SELECTOR SWITCH
7405 74HC4094D SRG8
7406 74HC4094D SRG8
Standby LED PCB
WIRE-PAD 0200
WIRE-PAD 0100
1400 FOR FMYY
1401 FOR FMYY
1403 FOR VCD
DIPMATE 20
TO VCD
TO CDC-KEY
FFC 1402
9403
NEWS (RETURN)
RDS (PBC)
DOLBY B
DSC
DBB
I S
DUBBING
RECORD
JOG DOWN
STANDBY
TIMER
JOG UP
S.BACK
S.UP
STOP
PLAY
PREV
NEXT
PROG
CD
TUNER
TAPE
AUX
REVERSE
DPL

Set	Setting1
C50/55/58/71 P73/75	0
C70/72,P78	1

NA : NOT APPLICABLE

NT : NON NTC .

NR : NON RDS ONLY

ND : NON DPL ONLY .

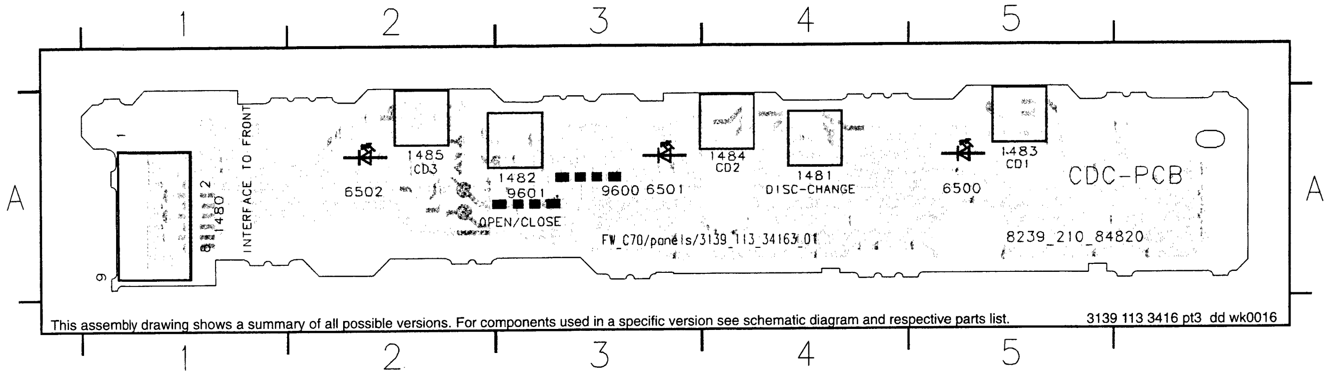
M : MTF ONLY.

: Provision only.

Note : Some values may varies, see respective parts list for correct value.

KEY-CDC BOARD - COMPONENT LAYOUT

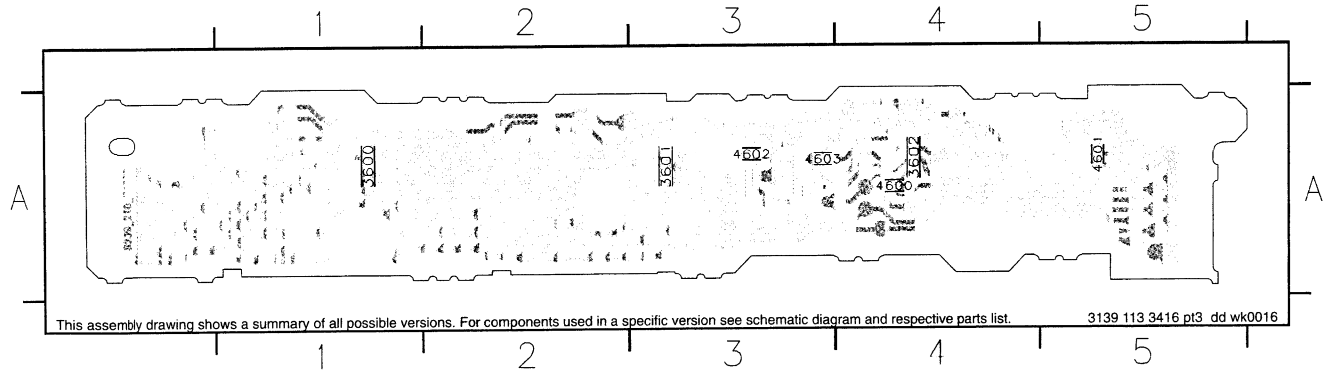
1480 A1	1481 A4	1482 A3	1483 A5	1484 A4	1485 A2	6500 A5	6501 A3	6502 A2	9600 A3	9601 A3


1
2
3
4
5
A
1480
INTERFACE TO FRONT
6502
1485
CD3
1482
9601
OPEN/CLOSE
9600
6501
1484
CD2
1481
DISC-CHANGE
6500
1483
CD1
CDC-PCB
FW_C70/panels/3139_113_34163_01
8239_210_84820

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list. 3139 113 3416 pt3 dd wk0016

KEY-CDC BOARD - CHIP LAYOUT

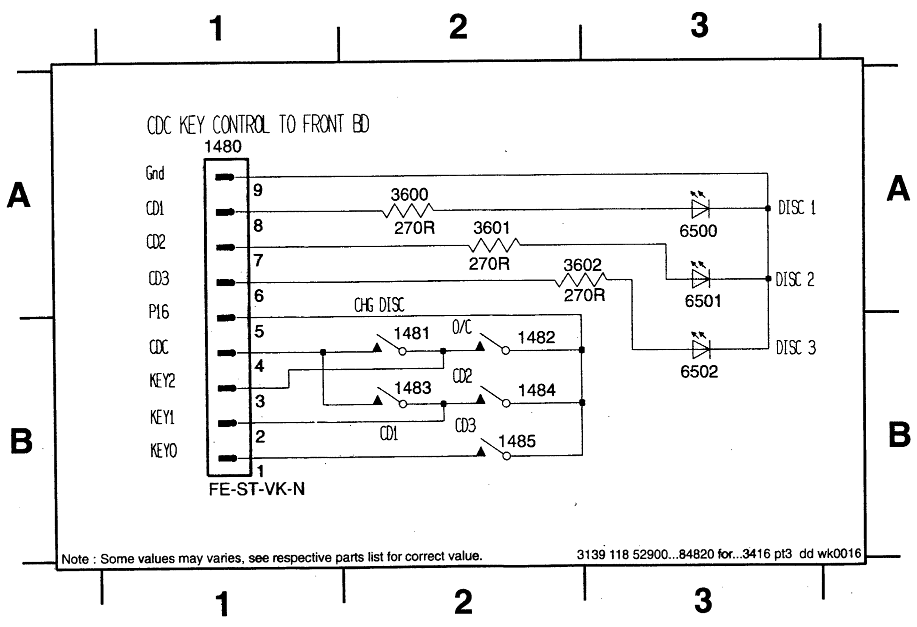
3600 A1	3601 A3	3602 A4	4600 A4	4601 A5	4602 A3	4603 A3


1
2
3
4
5
A
3600
3601
4602
4603
3602
4600
4601

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list. 3139 113 3416 pt3 dd wk0016

KEY-CDC PART - CIRCUIT DIAGRAM

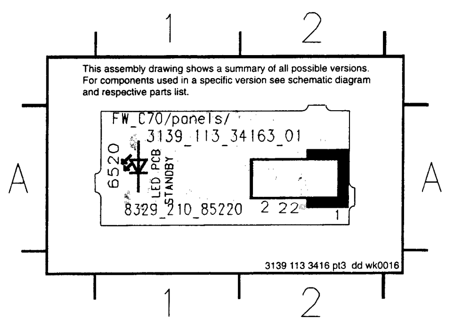
1480 A1	1482 B2	1484 B2	3600 A2	3602 A3	6501 A3
1481 B2	1483 B2	1485 B2	3601 A2	6500 A3	6502 B3


1
2
3
A
B
CDC KEY CONTROL TO FRONT BD
1480
Gnd
CD1
CD2
CD3
P16
CDC
KEY2
KEY1
KEY0
9
8
7
6
5
4
3
2
1
3600
270R
3601
270R
3602
270R
6500
6501
6502
DISC 1
DISC 2
DISC 3
CHG DISC
1481
O/C
1482
1483
CD2
1484
CD1
CD3
1485
FE-ST-VK-N

Note : Some values may varies, see respective parts list for correct value. 3139 118 52900...84820 for...3416 pt3 dd wk0016

STANDBY LED BOARD - COMPONENT LAYOUT

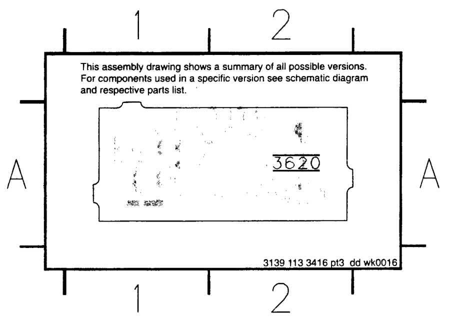
22 A2	6520 A1


1
2
A
FW_C70/panels/
3139_113_34163_01
6520
LED PCB STANDBY
8329_210_85220
22

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list. 3139 113 3416 pt3 dd wk0016

STANDBY LED BOARD - CHIP LAYOUT

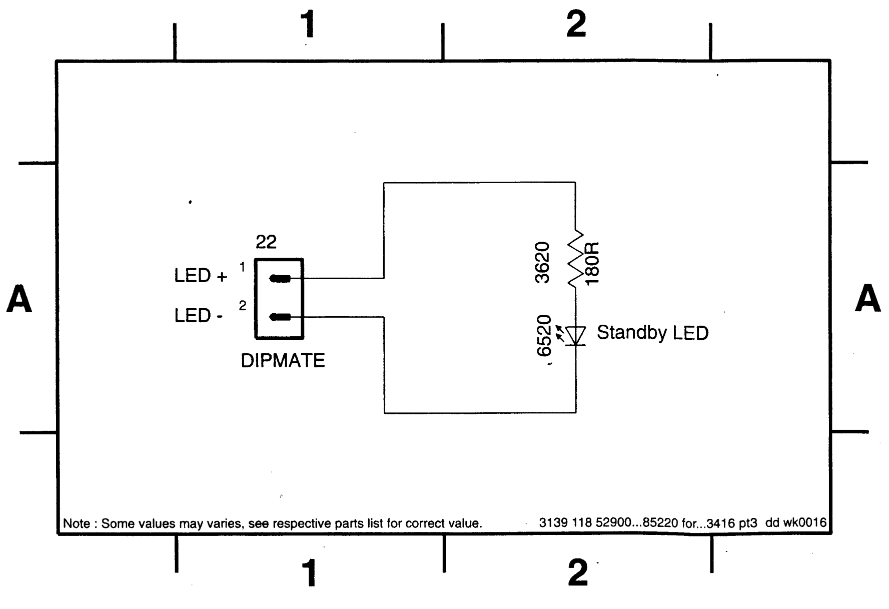
3620 A2



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list. 3139 113 3416 pt3 dd wk0016

STANDBY LED PART - CIRCUIT DIAGRAM

22 A1	3620 A2	6520 A2


1
2
A
22
LED +
LED -
DIPMATE
3620
180R
6520
Standby LED

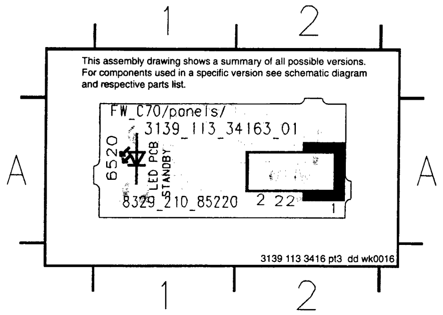
Note : Some values may varies, see respective parts list for correct value. 3139 118 52900...85220 for...3416 pt3 dd wk0016

KARAOKE BO

KARAOKE BC

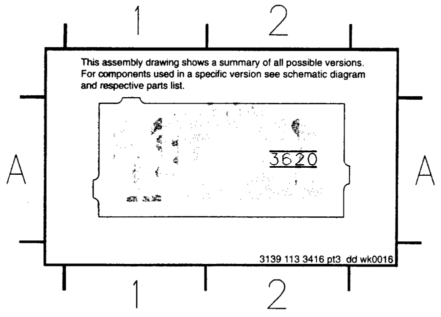
STANDBY LED BOARD - COMPONENT LAYOUT

22 A2 6520 A1


1
2
A
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
FW_C70/panels/
3139_113_34163_01
6520
LED PCB STANDBY
8329_210_85220
2 22
1
3139 113 3416 pt3 dd wk0016

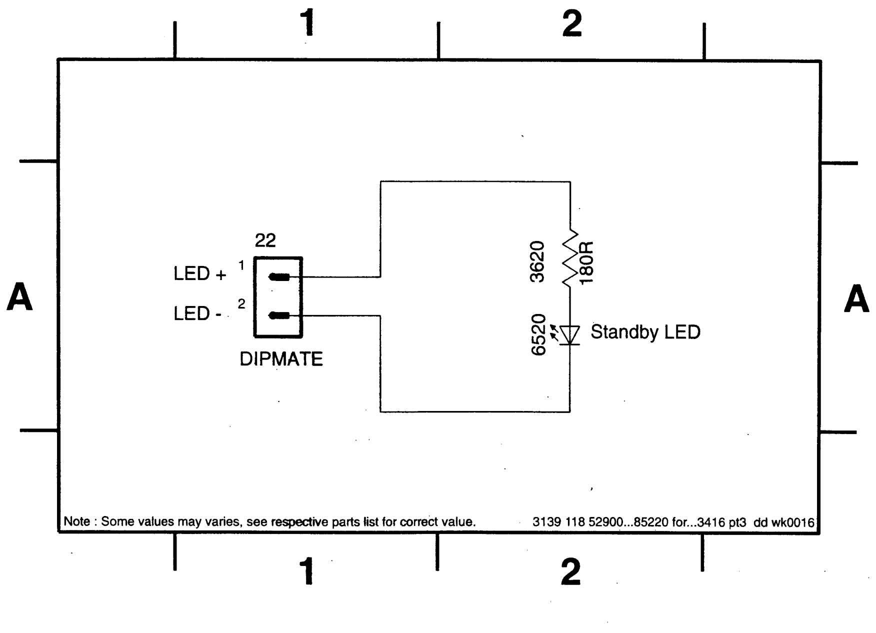
STANDBY LED BOARD - CHIP LAYOUT

3620 A2


1
2
A
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
3620
3139 113 3416 pt3 dd wk0016

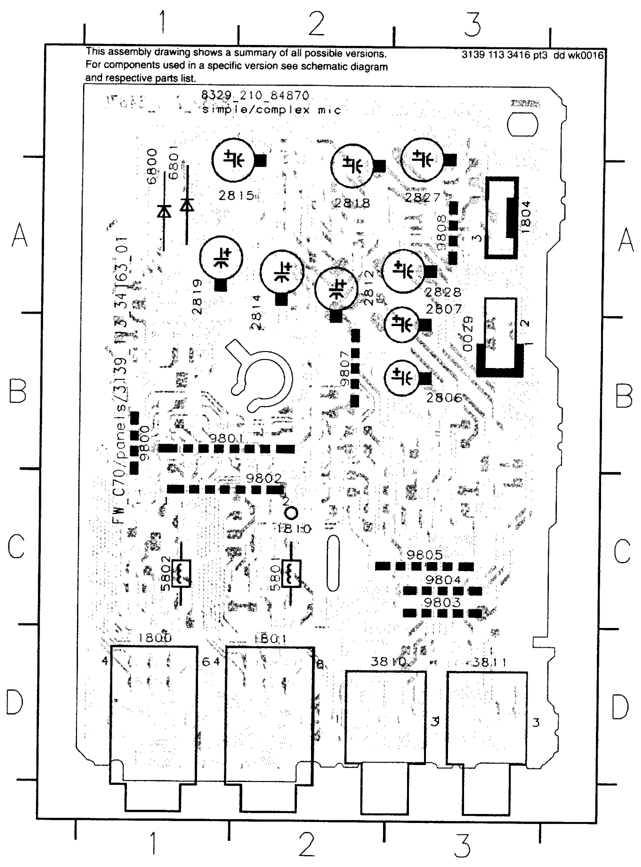
STANDBY LED PART - CIRCUIT DIAGRAM

22 A1 3620 A2 6520 A2


1
2
A
22
LED +
LED -
1
2
DIPMATE
3620
180R
6520
Standby LED

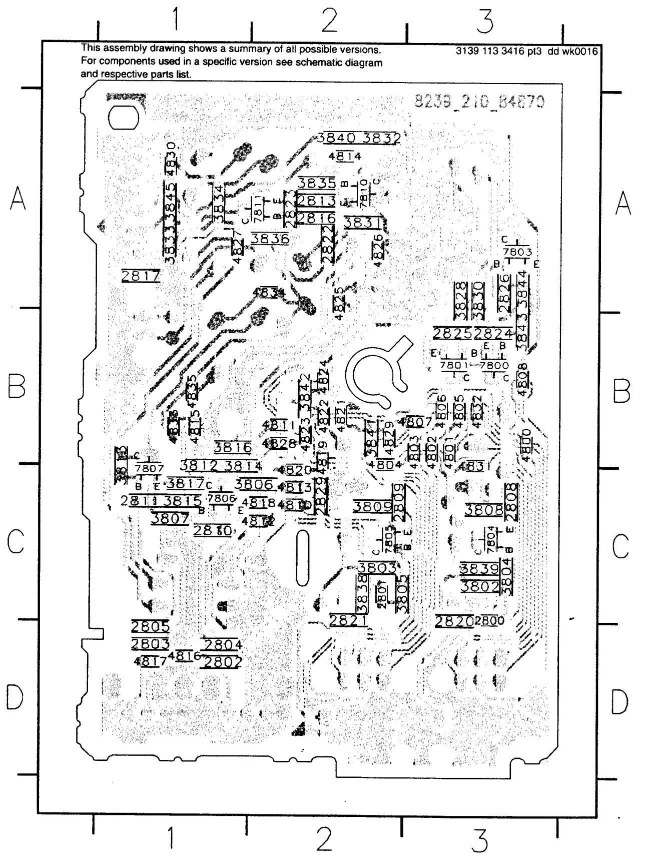
Note : Some values may varies, see respective parts list for correct value. 3139 118 52900...85220 for...3416 pt3 dd wk0016

KARAOKE BOARD - COMPONENT LAYOUT


1
2
3
A
B
C
D
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
3139 113 3416 pt3 dd wk0016
8329_210_84870
simple/complex mic
FW_C70/panels/3139_113_34163_01
6800
6801
2815
2818
2827
9808
1804
2819
2814
2812
2828
2807
0029
9807
2806
9800
9801
9802
1810
5802
5801
9805
9804
9803
1800
1801
3810
3811

0029	B3
1800	D1
1801	D2
1804	A3
1810	C2
2806	B3
2807	A3
2812	A2
2814	A2
2815	A1
2818	A2
2819	A1
2827	A3
2828	A3
3810	D3
3811	D3
5801	C2
5802	C1
6800	A1
6801	A1
9800	B1
9801	B1
9802	C2
9803	C3
9804	C3
9805	C3
9807	B2
9808	A3

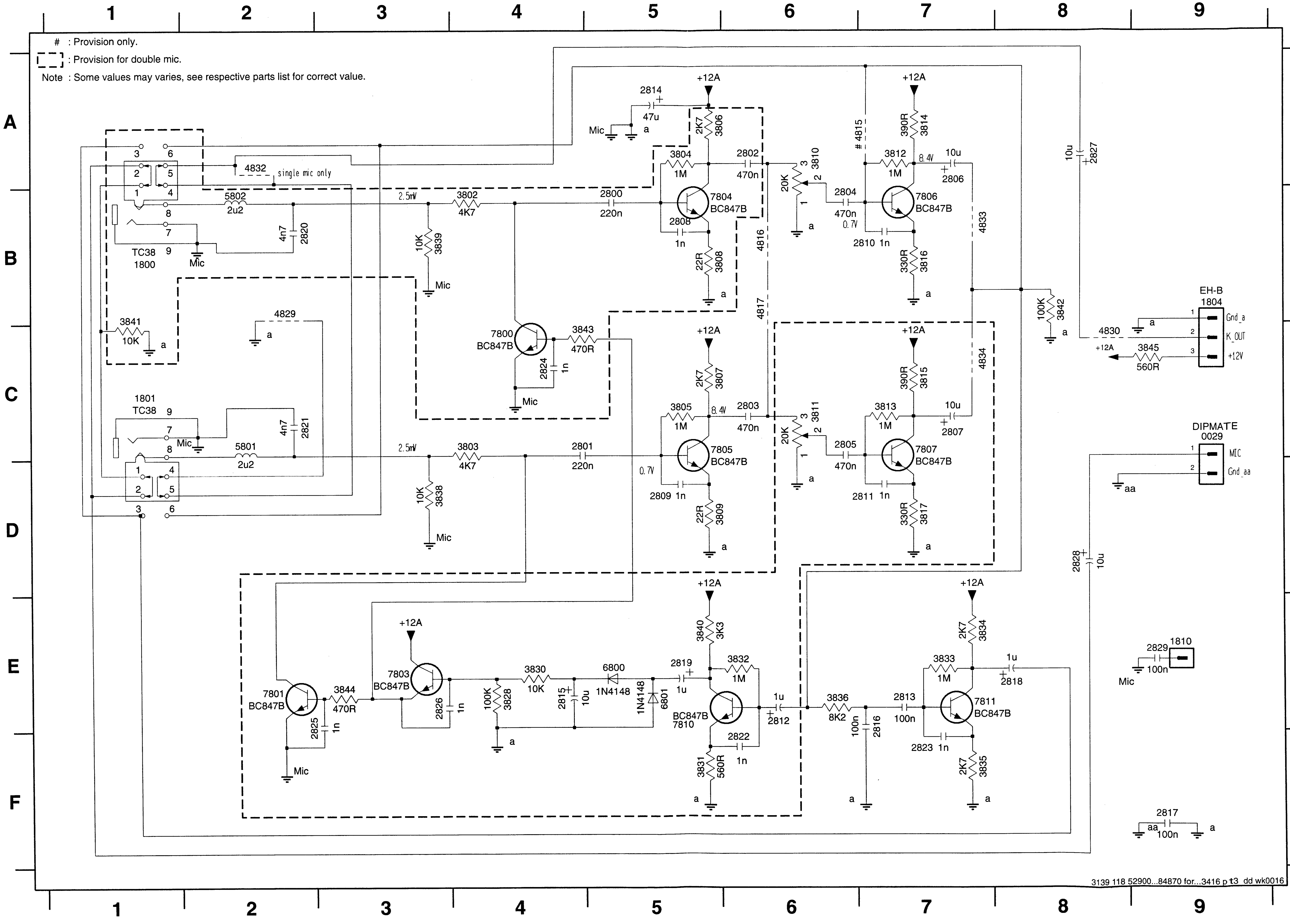
KARAOKE BOARD - CHIP LAYOUT


1
2
3
A
B
C
D
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
3139 113 3416 pt3 dd wk0016
8239_210_84870
3840 3832
2817
3816
2805
2803
2804
2802
2821
2820
3802
3839

2800	C3
2801	C2
2802	D1
2803	D1
2804	D1
2805	D1
2808	C3
2809	C2
2810	C1
2811	C1
2813	A2
2816	A2
2817	A1
2820	C3
2821	C2
2822	A2
2823	A2
2824	B3
2825	B3
2826	A3
2829	C2
3802	C3
3803	C2
3804	C3
3805	C2
3806	C2
3807	C1
3808	C3
3809	C2
3812	C1
3813	C1
3814	C1
3815	C1
3816	B1
3817	C1
3828	A3
3830	A3
3831	A2
3832	A2
3833	A1
3834	A1
3835	A2
3836	A2
3838	C2
3839	C3
3840	A2
3841	B2
3842	B2
3843	B3
3844	A3
3845	A1
4800	B3
4801	B3
4802	B3
4803	B3
4804	B2
4805	B3
4806	B3
4807	B3
4808	B3
4810	C2
4811	B2
4812	C2
4813	C2
4814	A2
4815	B1
4816	D1
4817	D1
4818	C2
4819	B2
4820	C2
4821	B2
4822	B2
4823	B2
4824	B2
4825	A2
4826	A2
4827	A1
4828	B2
4829	B2
4830	A1
4831	B3
4832	B3
4833	B1
4834	A2
4835	B1
7800	B3
7801	B3
7803	A3
7804	C3
7805	C2
7806	C1
7807	C1
7810	A2
7811	A2

KARAOKE PART - CIRCUIT DIAGRAM

0029 C9	1810 E9	2803 C6	2807 C7	2811 D7	2815 E4	2819 E5	2823 F7	2827 A8	3803 C4	3807 C5	3811 C6	3815 C7	3830 E4	3834 E7	3839 B3	3843 C4	4816 B6	4832 A2	5802 B2	7801 E2	7806 B7
1800 B1	2800 B5	2804 B6	2808 B5	2812 E6	2816 E7	2820 B2	2824 C4	2828 D8	3804 A5	3808 B5	3812 A7	3816 B7	3831 F5	3835 F7	3840 E5	3844 E3	4817 B6	4833 B7	6800 E5	7803 E3	7807 C7
1801 C1	2801 C4	2805 C6	2809 D5	2813 E7	2817 F9	2821 C2	2825 E3	2829 E9	3805 C5	3809 D5	3813 C7	3817 D7	3832 E6	3836 E6	3841 B1	3845 C9	4829 B2	4834 C7	6801 E5	7804 B5	7810 E5
1804 B9	2802 A6	2806 A7	2810 B7	2814 A5	2818 E8	2822 F6	2826 E3	3802 B4	3806 A5	3810 A6	3814 A7	3828 E4	3833 E7	3838 D3	3842 B8	4815 A7	4830 C8	5801 C2	7800 C4	7805 C5	7811 E7



: Provision only.

[ ] : Provision for double mic.

Note : Some values may varies, see respective parts list for correct value.

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
TC38
1800
1801
Mic
4832
single mic only
5802
2u2
5801
4n7
2820
2821
3841
10K
a
4829
2.5mV
3802
4K7
3803
3839
3838
7800
BC847B
3843
470R
2824
1n
+12A
2814
47u
3806
2K7
3804
1M
2802
470n
2800
220n
2808
7804
3808
22R
3807
3805
8.4V
2803
2801
0.7V
7805
2809 1n
3809
4816
4817
3810
3811
20K
2804
2805
# 4815
3812
3813
3814
390R
3815
7806
7807
2806
10u
2807
2810 1n
2811 1n
3816
3817
330R
4833
4834
2827
3842
100K
4830
3845
560R
EH-B
1804
Gnd_a
K_OUT
+12V
DIPMATE
0029
MIC
Gnd_aa
aa
2828
7801
3844
2825
7803
2826
3828
3830
2815
6800
1N4148
6801
2819
1u
3840
3K3
3832
7810
2822
3831
2812
3836
8K2
2816
100n
2813
3833
7811
3834
2818
2823
3835
2829
1810
2817

3139 118 52900...84870 for...3416 p t3 dd wk0016

MISCELLANEOUS

1402	4822 265 11531	Flex Connector 9P
1403	4822 267 10756	Flex Connector 13P
1404	4822 267 10953	Flex Connector 7P
1408	4822 242 72195	QUARZ 4,332MHz
1409	4822 273 10366	Rotary Encoder 24P
1410	4822 273 10365	Rotary Encoder 24P
1411	4822 242 72066	Ceramic Resonator
1412	2422 543 01069	RES XTL 32kHz768
1415	3139 110 52230	FTD Display
1441	4822 276 13775	Tact Switch
1442	4822 276 13775	Tact Switch
1443	4822 276 13775	Tact Switch
1444	4822 276 13775	Tact Switch
1445	4822 276 13775	Tact Switch
1447	4822 276 13775	Tact Switch
1448	4822 276 13775	Tact Switch
1450	4822 276 13775	Tact Switch
1451	4822 276 13775	Tact Switch
1452	4822 276 13775	Tact Switch
1453	4822 276 13775	Tact Switch
1454	4822 276 13775	Tact Switch
1455	4822 276 13775	Tact Switch
1456	4822 276 13775	Tact Switch
1457	4822 276 13775	Tact Switch
1458	4822 276 13775	Tact Switch
1459	4822 276 13775	Tact Switch
1460	4822 276 13775	Tact Switch
1461	4822 276 13775	Tact Switch
1462	4822 276 13775	Tact Switch
1463	4822 276 13775	Tact Switch
1480	4822 265 11531	Flex Connector 9P
1481	4822 276 13775	Tact Switch
1482	4822 276 13775	Tact Switch
1483	4822 276 13775	Tact Switch
1484	4822 276 13775	Tact Switch
1485	4822 276 13775	Tact Switch
1801	4822 265 11529	Headphone Socket

CAPACITORS

2400	5322 122 32448	10pF 5% 63V
2401	5322 122 32448	10pF 5% 63V
2402	5322 122 32448	10pF 5% 63V
2403	4822 126 13692	47pF 1% 63V
2404	4822 126 13692	47pF 1% 63V
2405	4822 126 13692	47pF 1% 63V
2406	4822 126 13692	47pF 1% 63V
2407	4822 126 13692	47pF 1% 63V
2408	4822 122 33173	560pF 10% 50V
2409	4822 122 33173	560pF 10% 50V
2410	4822 124 22652	2,2µF 20% 50V
2411	4822 126 14585	100nF 10% 50V
2412	4822 126 13692	47pF 1% 63V
2413	4822 126 13692	47pF 1% 63V
2414	4822 126 13692	47pF 1% 63V
2415	5322 122 32448	10pF 5% 63V
2416	5322 122 32448	10pF 5% 63V
2417	4822 126 13486	15pF 2% 63V
2418	4822 126 13486	15pF 2% 63V
2419	5322 122 32659	33pF 5% 50V
2420	5322 122 32659	33pF 5% 50V
2422	4822 122 33177	10nF 20% 50V
2423	4822 122 33177	10nF 20% 50V
2424	4822 121 51387	10nF 20% 16V
2425	4822 121 51387	10nF 20% 16V
2426	4822 124 80483	47µF 20% 6,3V
2428	4822 124 80483	47µF 20% 6,3V
2431	5322 122 32531	100pF 5% 50V
2432	5322 122 32531	100pF 5% 50V
2433	5322 122 32531	100pF 5% 50V
2434	5322 122 32531	100pF 5% 50V
2435	5322 122 32531	100pF 5% 50V
2436	5322 122 32531	100pF 5% 50V
2441	5322 122 32531	100pF 5% 50V
2442	5322 122 32531	100pF 5% 50V
2445	4822 126 14585	100nF 10% 50V
2446	4822 126 13695	82pF 1% 63V
2447	4822 126 13692	47pF 1% 63V
2448	4822 126 13751	47nF 10% 63V
2449	4822 122 33127	2,2nF 10% 63V
2450	5322 122 34098	10nF 10% 63V
2451	4822 126 14585	100nF 10% 50V
2452	5322 122 34098	10nF 10% 63V
2453	4822 124 40746	0,22µF 20% 63V
2454	4822 122 33806	820pF 10% 63V
2455	4822 124 40746	0,22µF 20% 63V
2456	5322 122 31866	6,8nF 10% 63V
2457	4822 126 14585	100nF 10% 50V
2458	4822 124 40746	0,22µF 20% 63V
2459	4822 126 13751	47nF 10% 63V
2460	4822 126 14043	1µF +80/-20% 16V
2462	4822 126 13838	100nF +80/-20% 50V
2463	4822 126 14585	100nF 10% 50V
2464	5322 122 32531	100pF 5% 50V
2465	4822 124 80483	47µF 20% 6,3V
2470	4822 122 33575	220pF 5% 63V
2471	4822 122 33575	220pF 5% 63V
2472	4822 122 33575	220pF 5% 63V
2473	4822 126 11585	22nF +80/-20% 25V
2481	4822 124 80483	47µF 20% 6,3V
2483	4822 124 12032	4,7µF 20% 50V
2484	4822 126 14043	1µF +80/-20% 16V
2485	4822 124 12032	4,7µF 20% 50V
2486	4822 126 14043	1µF +80/-20% 16V
2487	4822 126 14585	100nF 10% 50V

2488	4822 126 13838	100nF +80/-20% 50V
2489	4822 126 13838	100nF +80/-20% 50V
2801	4822 126 14076	220nF +80/-20% 25V
2803	4822 126 13482	470nF +80/-20% 16V
2804	4822 126 13482	470nF +80/-20% 16V
2806	4822 124 40248	10µF 20% 63V
2809	5322 122 31647	1nF 10% 63V
2810	5322 122 31647	1nF 10% 63V
2813	4822 126 13838	100nF +80/-20% 50V
2814	4822 124 40433	47µF 20% 25V
2816	4822 126 13838	100nF +80/-20% 50V
2817	4822 126 14585	100nF 10% 50V
2818	4822 124 21913	1µF 20% 63V
2821	5322 126 10223	4,7nF 10% 63V
2823	5322 126 10511	1nF 5% 50V
2827	4822 124 40248	10µF 20% 63V
2828	4822 124 40248	10µF 20% 63V
2829	4822 126 13838	100nF +80/-20% 50V

RESISTORS

3397	4822 117 13577	330R 1% 1,25W
3400	4822 051 10102	1k 2% 0,25W
3401	4822 117 10833	10k 1% 0,1W
3402	4822 051 10102	1k 2% 0,25W
3403	4822 117 10833	10k 1% 0,1W
3404	4822 051 20182	1k8 5% 0,1W
3405	4822 117 10833	10k 1% 0,1W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 117 10833	10k 1% 0,1W
3409	4822 051 20471	470R 5% 0,1W
3410	4822 051 10102	1k 2% 0,25W
3411	4822 051 10102	1k 2% 0,25W
3412	4822 051 10102	1k 2% 0,25W
3413	4822 051 10102	1k 2% 0,25W
3414	4822 051 10102	1k 2% 0,25W
3415	4822 051 10102	1k 2% 0,25W
3416	4822 117 11449	2k2 5% 0,1W
3417	4822 051 20471	470R 5% 0,1W
3418	4822 051 20471	470R 5% 0,1W
3419	4822 051 10102	1k 2% 0,25W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 20101	100R 5% 0,1W
3424	4822 051 20101	100R 5% 0,1W
3425	4822 051 20101	100R 5% 0,1W
3426	4822 051 20101	100R 5% 0,1W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 20101	100R 5% 0,1W
3430	4822 051 20101	100R 5% 0,1W
3431	4822 051 20101	100R 5% 0,1W
3432	4822 051 20101	100R 5% 0,1W
3433	4822 051 20101	100R 5% 0,1W
3434	4822 051 20101	100R 5% 0,1W
3435	4822 051 20101	100R 5% 0,1W
3436	4822 051 20101	100R 5% 0,1W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3450	4822 051 10102	1k 2% 0,25W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 051 10102	1k 2% 0,25W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 051 10102	1k 2% 0,25W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 051 10102	1k 2% 0,25W
3462	4822 051 10102	1k 2% 0,25W
3463	4822 051 10102	1k 2% 0,25W
3464	4822 051 10102	1k 2% 0,25W
3465	4822 051 10102	1k 2% 0,25W
3466	4822 051 10102	1k 2% 0,25W
3467	4822 051 10102	1k 2% 0,25W
3468	4822 051 20105	1M 5% 0,1W
3469	4822 117 10833	10k 1% 0,1W
3470	4822 117 10833	10k 1% 0,1W
3472	4822 117 10833	10k 1% 0,1W
3473	4822 117 10833	10k 1% 0,1W
3474	4822 116 52175	100R 5% 0,5W
3475	4822 116 52175	100R 5% 0,5W
3476	4822 117 10834	47k 1% 0,1W
3479	4822 051 10102	1k 2% 0,25W
3480	4822 051 10102	1k 2% 0,25W
3481	4822 051 10102	1k 2% 0,25W
3482	4822 051 10102	1k 2% 0,25W
3483	4822 051 10102	1k 2% 0,25W
3484	4822 117 10833	10k 1% 0,1W
3485	4822 117 10833	10k 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3486	4822 050 21003	10k 1% 0,6W
3487	4822 117 13579	220k 1% 0,1W
3488	4822 117 11449	2k2 5% 0,1W
3489	4822 117 10833	10k 1% 0,1W
3490	4822 117 10834	47k 1% 0,1W
3491	4822 117 10833	10k 1% 0,1W
3492	4822 117 10834	47k 1% 0,1W
3493	4822 117 10833	10k 1% 0,1W
3494	4822 117 10833	10k 1% 0,1W
3497	4822 051 20101	100R 5% 0,1W
3498	4822 117 10833	10k 1% 0,1W
3499	4822 051 10102	1k 2% 0,25W
3500	4822 051 10102	1k 2% 0,25W
3501	4822 117 10837	100k 1% 0,1W
3509	4822 117 11503	220R 1% 0,1W
3510	4822 117 11503	220R 1% 0,1W
3511	4822 116 52298	680k 5% 0,5W
3514	4822 117 13577	330R 1% 1,25W
3516	4822 117 11503	220R 1% 0,1W
3523	4822 117 10833	10k 1% 0,1W
3534	4822 117 13577	330R 1% 1,25W
3535	4822 117 13577	330R 1% 1,25W
3536	4822 117 13577	330R 1% 1,25W
3537	4822 117 13577	330R 1% 1,25W
3538	4822 117 13577	330R 1% 1,25W
3539	4822 117 13577	330R 1% 1,25W
3540	4822 117 13577	330R 1% 1,25W
3541	4822 117 13577	330R 1% 1,25W
3542	4822 117 13577	330R 1% 1,25W
3543	4822 117 13577	330R 1% 1,25W
3544	4822 051 20474	470k 5% 0,1W
3545	4822 051 20474	470k 5% 0,1W
3546	4822 051 20474	470k 5% 0,1W
3547	4822 051 20474	470k 5% 0,1W
3548	4822 117 11139	1k5 1% 0,1W
3549	4822 051 20684	680k 5% 0,1W
3550	4822 117 10834	47k 1% 0,1W
3551	4822 051 20474	470k 5% 0,1W
3552	4822 117 11139	1k5 1% 0,1W
3553	4822 051 20684	680k 5% 0,1W
3554	4822 117 10834	47k 1% 0,1W
3555	4822 051 20474	470k 5% 0,1W
3556	4822 117 11139	1k5 1% 0,1W
3557	4822 051 20684	680k 5% 0,1W
3558	4822 117 10834	47k 1% 0,1W
3559	4822 051 20474	470k 5% 0,1W
3566	4822 117 11503	220R 1% 0,1W
3567	4822 117 11503	220R 1% 0,1W
3568	4822 117 11503	220R 1% 0,1W
3570	4822 117 11149	82k 1% 0,1W
3571	4822 117 11149	82k 1% 0,1W
3572	4822 117 11149	82k 1% 0,1W
3575	4822 117 11149	82k 1% 0,1W
3576	4822 051 10102	1k 2% 0,25W
3577	4822 051 20182	1k8 5% 0,1W
3586	4822 116 83884	47k 5% 0,5W
3587	4822 116 83884	47k 5% 0,5W
3592	4822 050 21003	10k 1% 0,6W
3600	4822 117 11504	270R 1% 0,1W
3601	4822 117 11504	270R 1% 0,1W
3602	4822 117 11504	270R 1% 0,1W
3803	4822 051 20472	4k7 5% 0,1W
3805	4822 051 20105	1M 5% 0,1W
3807	4822 117 12955	2k7 1% 0,1W
3809	4822 051 20229	22R 5% 0,1W
3810	4822 101 21204	20kA
3812	4822 051 20105	1M 5% 0,1W
3814	4822 051 20391	390R 5% 0,1W
3816	4822 117 13577	330R 1% 1,25W
3833	4822 051 20105	1M 5% 0,1W
3834	4822 117 12955	2k7 1% 0,1W
3835	4822 117 12955	2k7 1% 0,1W
3836	4822 051 20822	8k2 5% 0,1W
3838	4822 117 10833	10k 1% 0,1W
3842	4822 117 10837	100k 1% 0,1W
3845	4822 051 20561	560R 5% 0,1W
4400	4822 051 20008	0R Jumper 0805
4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4422	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4432	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805

4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805
4452	4822 051 20008	0R Jumper 0805
4453	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4457	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4459	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4461	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4473	4822 051 20008	0R Jumper 0805
4474	4822 051 20008	0R Jumper 0805
4475	4822 051 20008	0R Jumper 0805
4476	4822 051 20008	0R Jumper 0805
4477	4822 051 20008	0R Jumper 0805
4478	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4480	4822 051 20008	0R Jumper 0805
4481	4822 051 20008	0R Jumper 0805
4482	4822 051 20008	0R Jumper 0805
4485	4822 051 20008	0R Jumper 0805
4490	4822 051 20008	0R Jumper 0805
4492	4822 051 20008	0R Jumper 0805
4493	4822 051 20008	0R Jumper 0805
4494	4822 051 20008	0R Jumper 0805
4495	4822 051 20008	0R Jumper 0805
4496	4822 051 20008	0R Jumper 0805
4497	4822 051 20008	0R Jumper 0805
4600	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4800	4822 051 20008	0R Jumper 0805
4803	4822 051 20008	0R Jumper 0805
4806	4822 051 20008	0R Jumper 0805
4808	4822 051 20008	0R Jumper 0805
4810	4822 051 20008	0R Jumper 0805
4811	4822 051 20008	0R Jumper 0805
4812	4822 051 20008	0R Jumper 0805
4813	4822 051 20008	0R Jumper 0805
4814	4822 051 20008	0R Jumper 0805
4816	4822 051 20008	0R Jumper 0805
4817	4822 051 20008	0R Jumper 0805
4821	4822 051 20008	0R Jumper 0805
4822	4822 051 20008	0R Jumper 0805
4824	4822 051 20008	0R Jumper 0805
4825	4822 051 20008	0R Jumper 0805
4826	4822 051 20008	0R Jumper 0805
4827	4822 051 20008	0R Jumper 0805
4828	4822 051 20008	0R Jumper 0805
4829	4822 051 20008	0R Jumper 0805
4830	4822 051 20008	0R Jumper 0805
4832	4822 051 20008	0R Jumper 0805
4833	4822 051 20008	0R Jumper 0805
4835	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 157 62552	Coil 2,2µH 5%
5401	4822 157 62552	Coil 2,2µH 5%
5402	4822 157 62552	Coil 2,2µH 5%
5801	4822 157 62552	Coil 2,2µH 5%

DIODES

6400	4822 130 31878	1N4003G
6402	4822 130 11589	LTL-1CHAE
6403	4822 130 11589	LTL-1CHAE
6404	4822 130 11589	LTL-1CHAE
6405	4822 130 11589	LTL-1CHAE
6461	4822 130 30621	1N4148
6462	4822 130 30621	1N4148
6463	4822 130 30621	1N4148
6464	4822 130 30621	1N4148
6465	4822 130 30621	1N4148
6466	4822 130 30621	1N4148
6467	4822 130 30621	1N4148
6468	4822 130 30621	1N4148
6469	4822 130 30621	1N4148
6470	4822 130 30621	1N4148
6471	4822 130 30621	1N4148
6472	4822 130 30621	1N4148
6473	4822 130 30621	1N4148
6474	4822 130 30621	1N4148
6475	4822 130 30621	1N4148
6476	4822 130 30621	1N4148
6478	4822 130 30621	1N4148
6483	4822 130 30621	1N4148
6484	4822 130 30621	1N4148
6485	4822 130 31878	1N4003G

ELECTRICAL PARTS LIST - FRONT BOARD

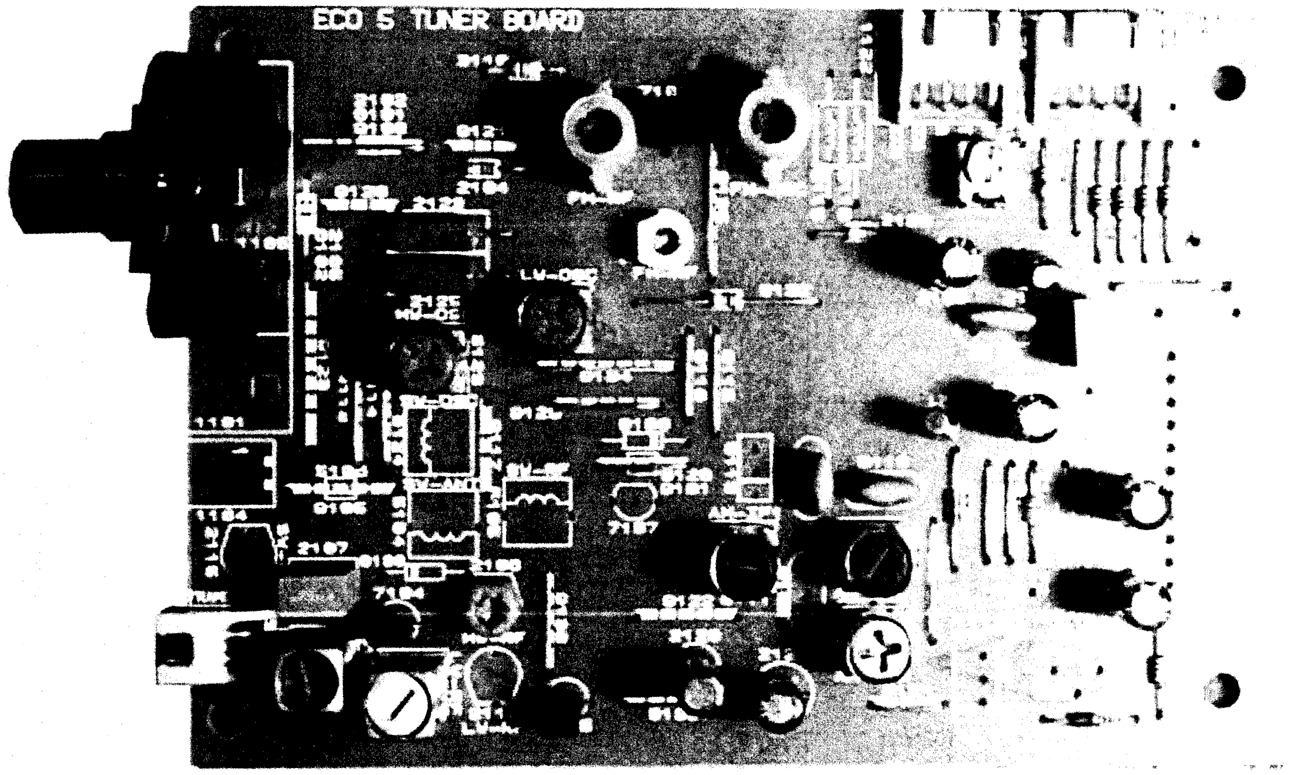
DIODES

6486	4822 130 30621	1N4148
6500	4822 130 11589	LTL-1CHAE
6501	4822 130 11589	LTL-1CHAE
6502	4822 130 11589	LTL-1CHAE

TRANSISTORS & INTEGRATED CIRCUITS

7400	3139 110 52421	TMP87CS71F - 'V55S52421'
7402	9322 143 19682	M24C01-WBN6
7403	4822 209 31981	SAA6579T/V1
7404	4822 130 10165	GR1U28XP
7405	4822 209 15449	74HC4094D
7420	4822 130 60511	BC847B
7421	4822 130 60511	BC847B
7422	4822 130 60511	BC847B
7425	4822 130 60511	BC847B
7427	4822 130 60511	BC847B
7805	4822 130 60511	BC847B
7806	4822 130 60511	BC847B
7811	4822 130 60511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.


ECO 5 TUNER BOARD

TUNER BOARD ECO5

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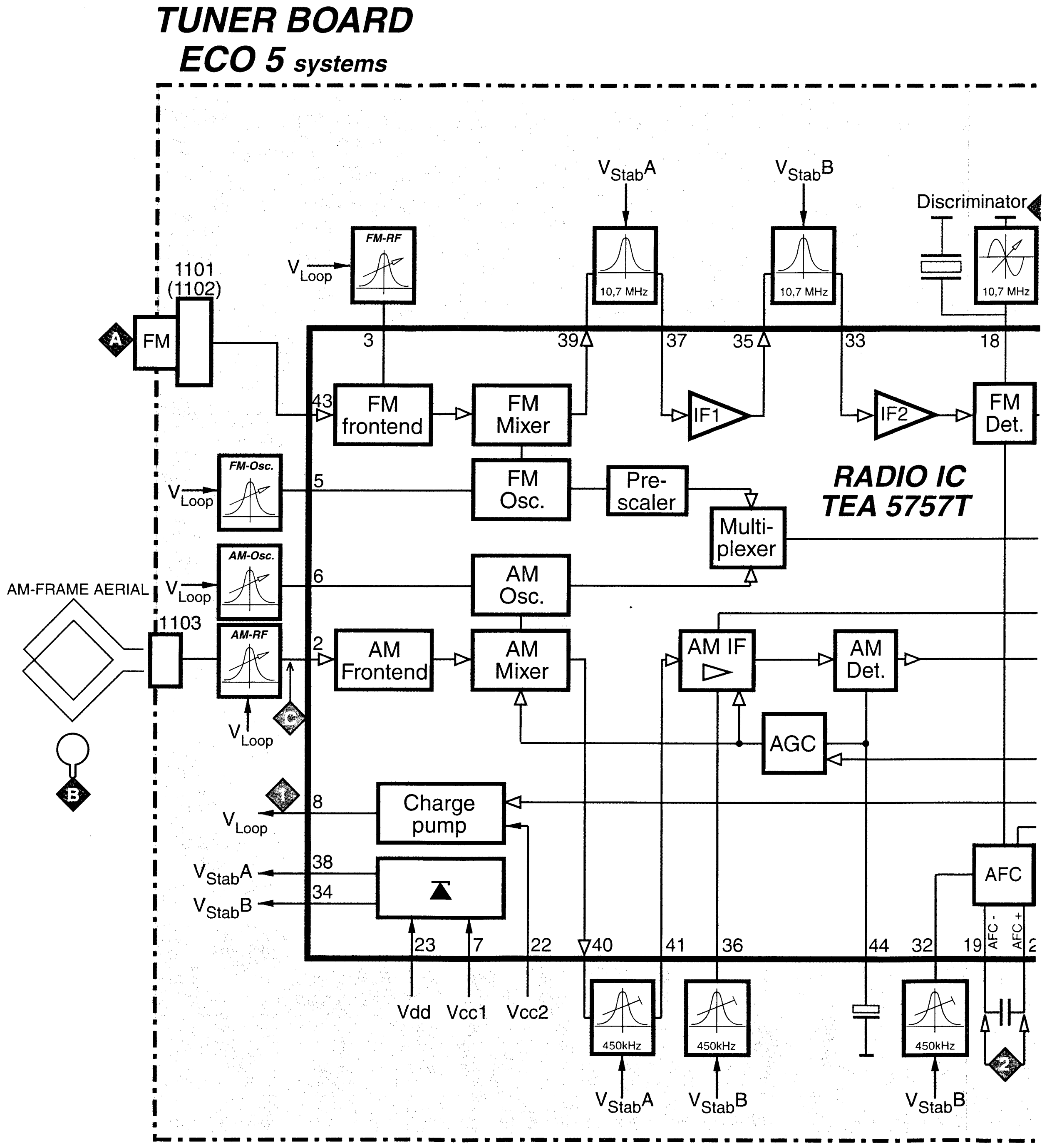
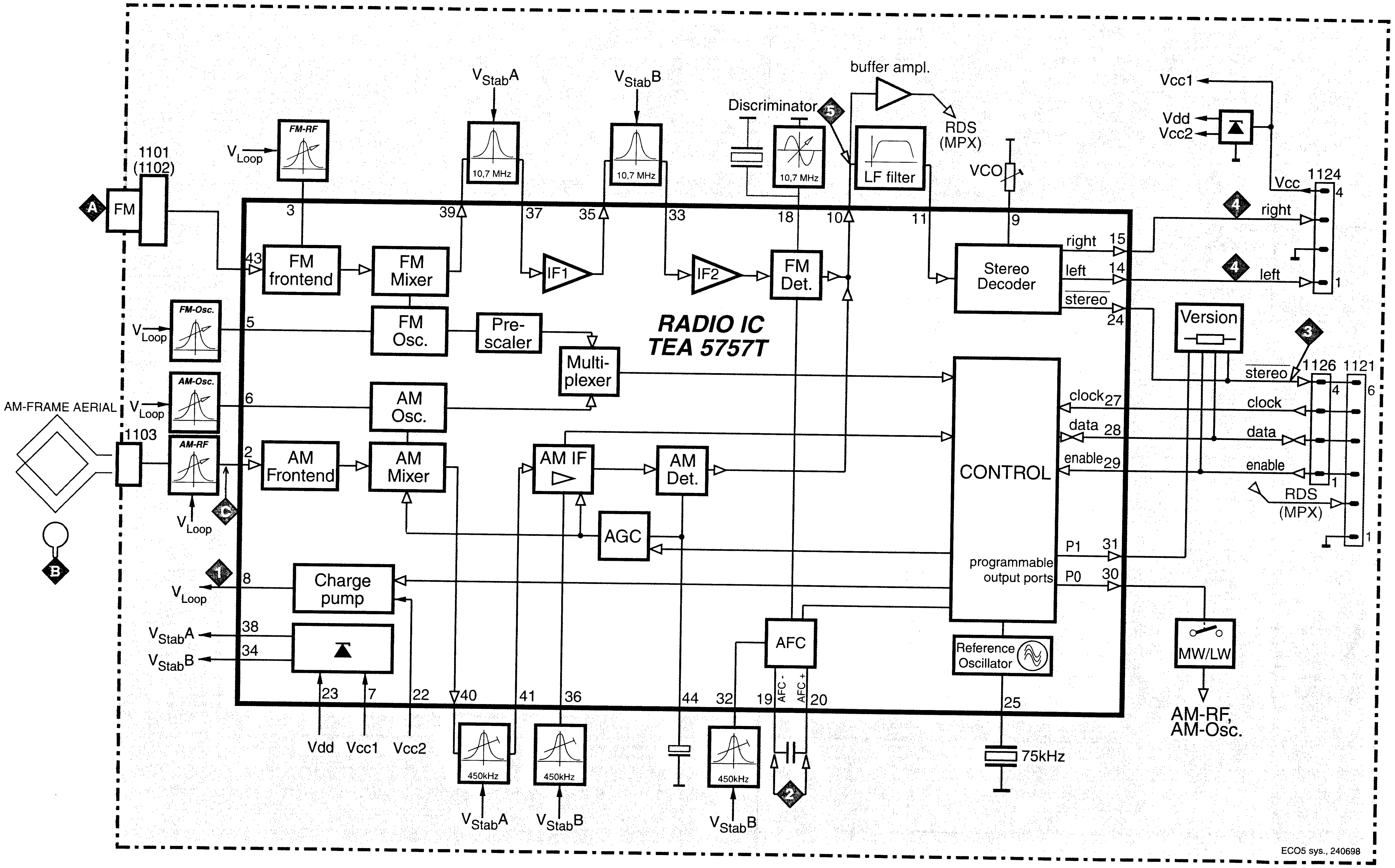
Component layout...7B-2
Circuit diagram 7B-3
Partslist 7B-4

BLOCKDIAGRAM

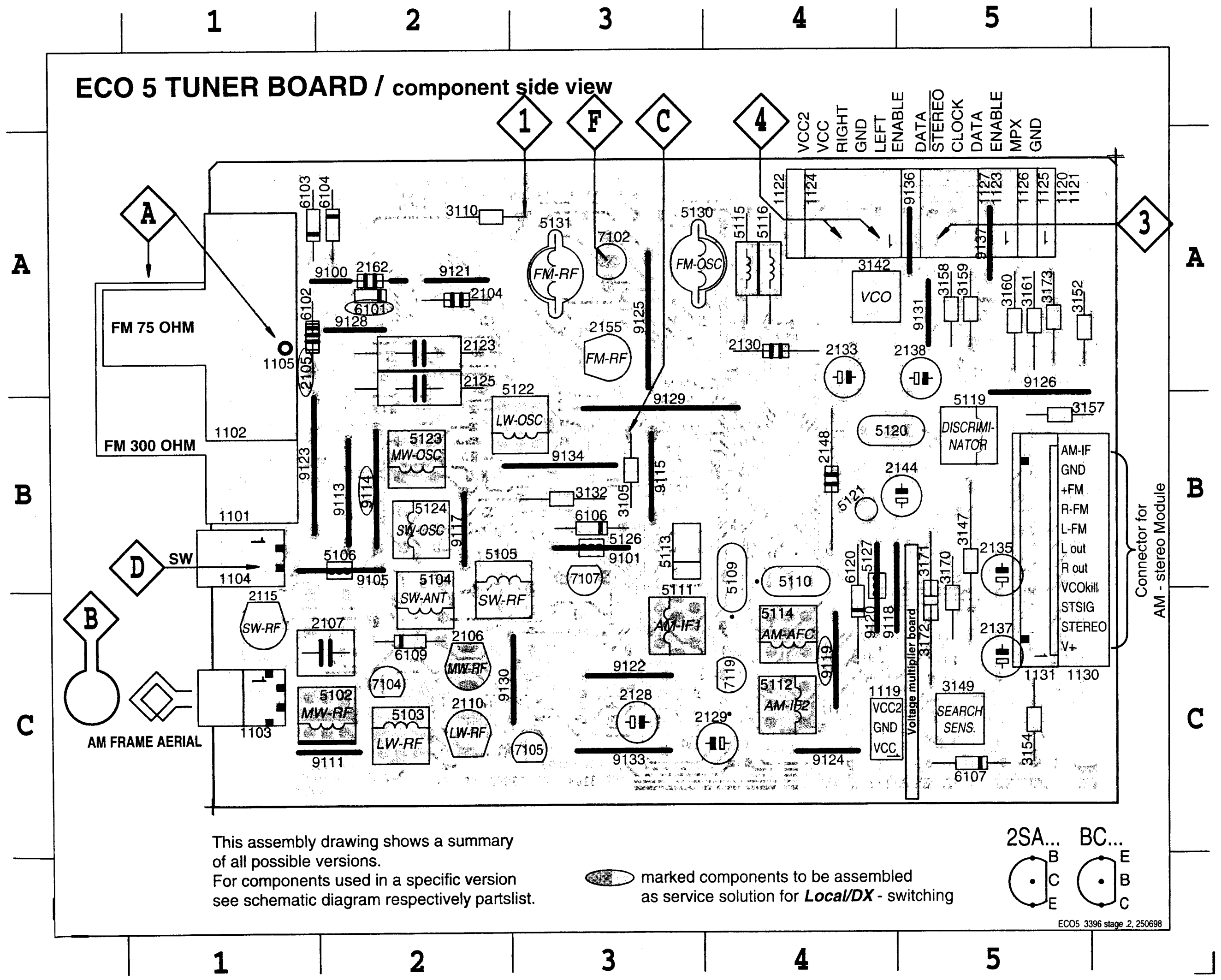

TUNER BOARD
ECO 5 systems
FM
1101
(1102)
FM-RF
V Loop
FM frontend
FM Mixer
FM-Osc.
FM Osc.
Pre-scaler
Multi-plexer
AM-Osc.
AM Osc.
AM-FRAME AERIAL
1103
AM-RF
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
Charge pump
V Stab A
V Stab B
IF1
IF2
FM Det.
Discriminator
10,7 MHz
RADIO IC
TEA 5757T
AFC
AFC -
AFC +
450kHz
Vdd
Vcc1
Vcc2
3
39
37
35
33
18
43
5
6
2
8
38
34
23
7
22
40
41
36
44
32
19
A
B
C
1
2

BLOCKDIAGRAM

TUNER BOARD
ECO 5 systems


RADIO IC
TEA 5757T
FM
1101
(1102)
A
V_Loop
FM-RF
FM frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
FM-Osc.
AM-Osc.
AM-RF
AM-FRAME AERIAL
1103
B
C
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
Charge pump
1
V_StabA
V_StabB
10,7 MHz
IF1
IF2
FM Det.
Discriminator
5
buffer ampl.
RDS (MPX)
LF filter
VCO
Stereo Decoder
right
left
stereo
CONTROL
clock
data
enable
programmable output ports
P1
P0
Reference Oscillator
AFC
AFC -
AFC +
2
75kHz
450kHz
Vdd
Vcc1
Vcc2
Vcc
1124
1126
1121
4
3
Version
MW/LW
AM-RF, AM-Osc.
43 3 39 37 35 33 18 10 11 9 15 14 24 27 28 29 31 30 25 5 6 2 8 38 34 23 7 22 40 41 36 44 32 19 20
ECO5 sys., 240698

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		

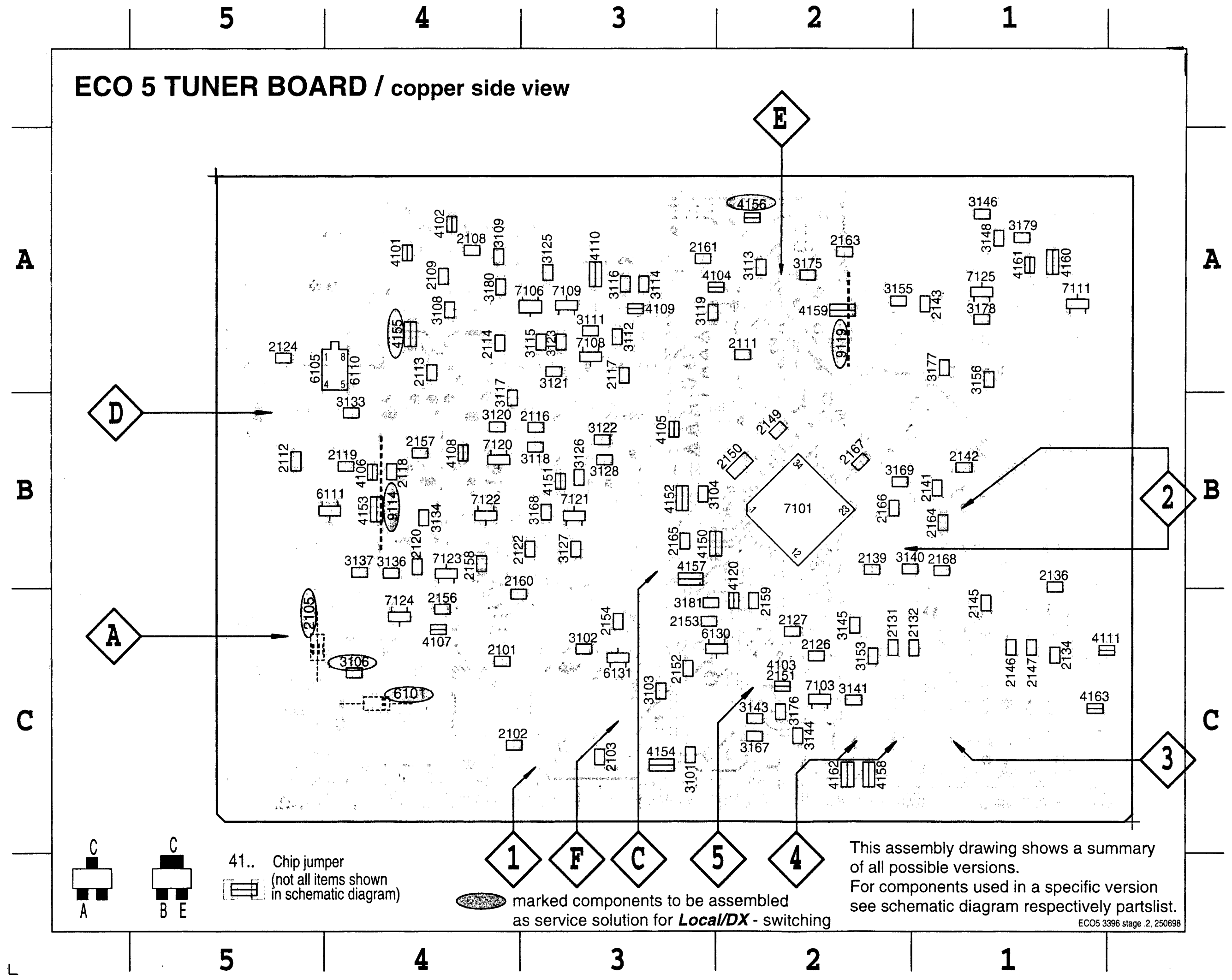

1
2
3
4
5
A
B
C
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
VCO
DISCRIMI-NATOR
SEARCH SENS.
Voltage multiplier board
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E
ECO5 3396 stage 2, 250698

ECO 5 TUNER BOARD / component side view

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4105	B3	4153	B4	6105	A4	7120	B4
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4106	B4	4154	C3	6110	A4	7121	B3
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4107	C4	4155	A4	6111	B4	7122	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4108	B4	4156	A2	6130	C2	7123	B4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4109	A3	4157	B3	6131	C3	7124	C4
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4110	A3	4158	C2	7101	B2	7125	A1
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	3181	C3	4111	C1	4159	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4101	A4	4120	C2	4160	A1	7106	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4102	A4	4150	B2	4161	A1	7108	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4103	C2	4151	B3	4162	C1	7109	A3		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4104	A2	4152	B3	4163	C1	7111	A1		


5
4
3
2
1
A
B
C
E
D
A
1
F
C
5
4
2
3
7101
C
A
C
B E
41..
Chip jumper
(not all items shown in schematic diagram)
ECO5 3396 stage 2, 250698

ECO 5 TUNER BOARD / copper side view

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER

Wave
VARICAF
FM 87.5 - 1 (65.81 - 74, 8
MW FM/AM-versior 530 - 17
FM/MW-versio 531 - 16
LW 153 - 27
MW FM/MW/LW- v 531 - 16
FM IF
FM
FM RF
FM 87.5 - 1 (65.81 - 74, 8
VCO
FM
AM IF
MW
AM AFC **MW**
AM RF 3
MW 4) FM/MW/LW- a (9kH 531 - 1
LW
MW FM/AM-versi 530 - 1

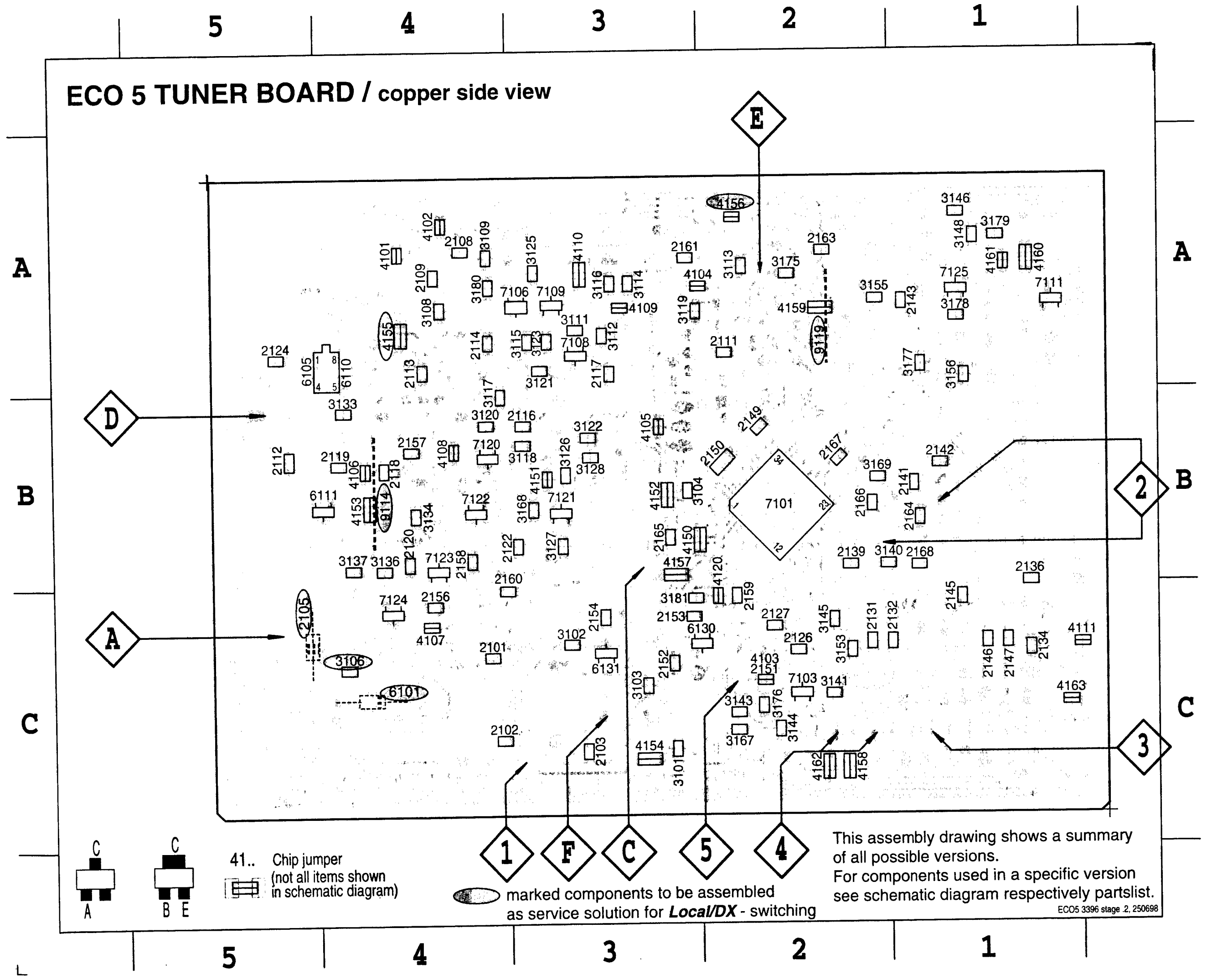
Use service

1) If sensitivi
(input sign

3) For AM Rl

↕ Repeat

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4105	B3	4153	B4	6105	A4	7120	B4
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4106	B4	4154	C3	6110	A4	7121	B3
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4107	C4	4155	A4	6111	B4	7122	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4108	B4	4156	A2	6130	C2	7123	B4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4109	A3	4157	B3	6131	C3	7124	C4
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4110	A3	4158	C2	7101	B2	7125	A1
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	3181	C3	4111	C1	4159	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4101	A4	4120	C2	4160	A1	7106	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4102	A4	4150	B2	4161	A1	7108	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4103	C2	4151	B3	4162	C1	7109	A3		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4104	A2	4152	B3	4163	C1	7111	A1		



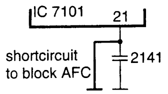
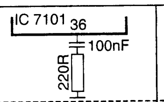
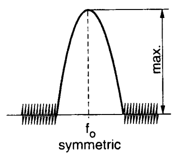
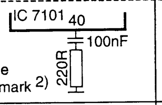
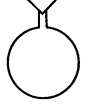
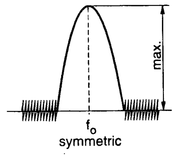
ECO 5 TUNER BOARD / copper side view

41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	◇F	 shortcircuit to block AFC	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇C Δf=±15kHz V_{RF} = 3mV		5111	◇4	
			 see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 10mV		5114	◇2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B  Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇4	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, discr. coil, 09797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

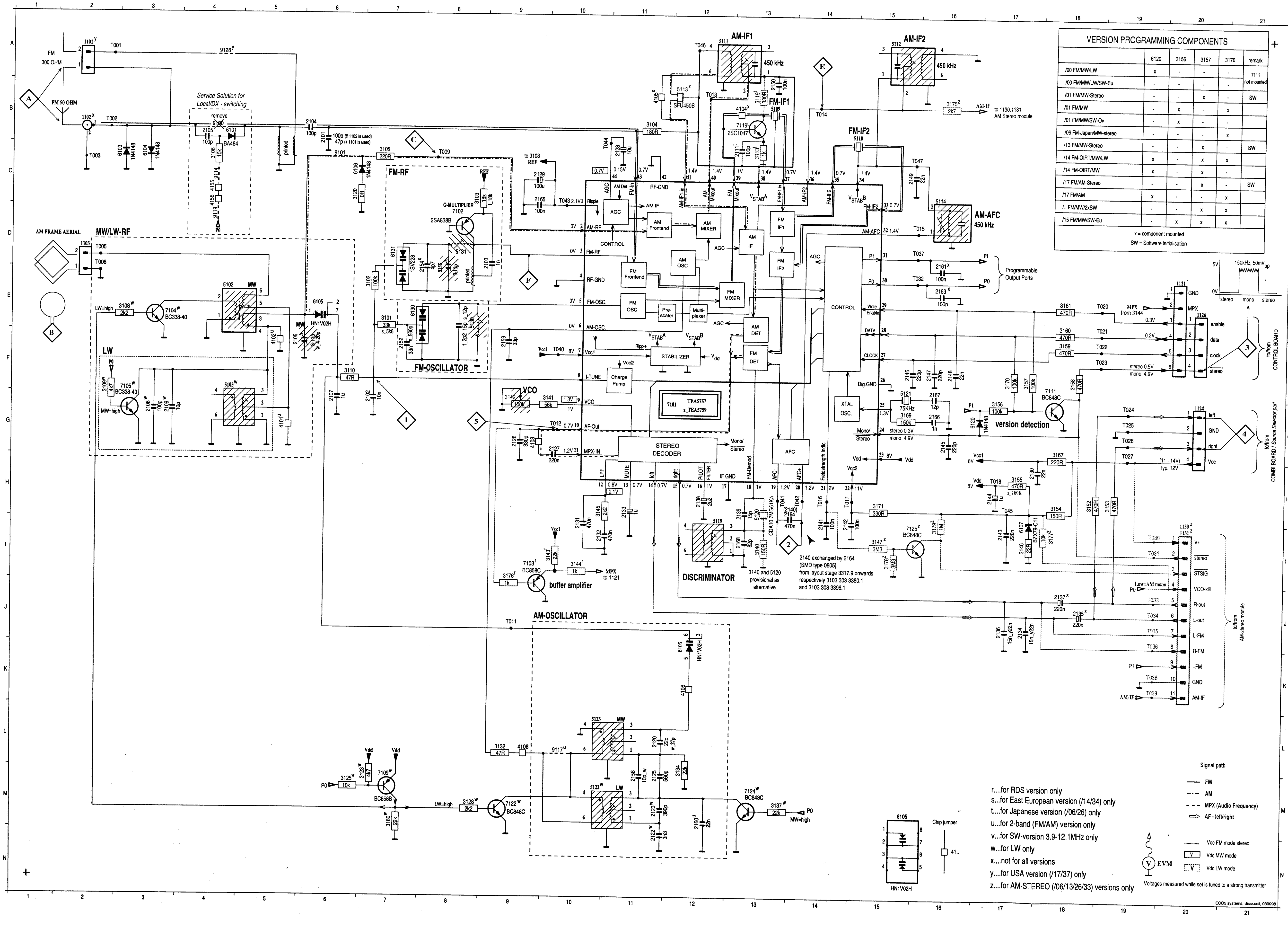
2) RC network serves for damping the IF-filter while adjusting the other oe.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50 OHM
AM FRAME AERIAL
MW/LW-RF
LW
Service Solution for Local/DX - switching
FM-RF
Q-MULTIPLIER
FM-OSCILLATOR
VCO
AM-IF1
AM-IF2
FM-IF1
FM-IF2
AM-AFC 450 kHz
450 kHz
AGC
AM Frontend
AM MIXER
AM OSC
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
FM IF1
FM IF2
AM IF
AM DET
FM DET
AFC
CONTROL
STABILIZER
Charge Pump
STEREO DECODER
XTAL OSC.
7101 TEA5757 z_TEA5759
DISCRIMINATOR
buffer amplifier
AM-OSCILLATOR
version detection
Programmable Output Ports
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
to 1130,1131 AM Stereo module
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
3140 and 5120 provisional as alternative
150kHz, 50mV pp
5V
0V
stereo
mono
stereo
Chip jumper
HN1V02H
EVM
ECO5 systems, discr.coil, 030998

VERSION PROGRAMMING COMPONENTS	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path

——	FM
-·-	AM
- - -	MPX (Audio Frequency)
⇨	AF - left/right
········	Vdc FM mode stereo
V	Vdc MW mode
V	Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805 5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W 5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

DIODES

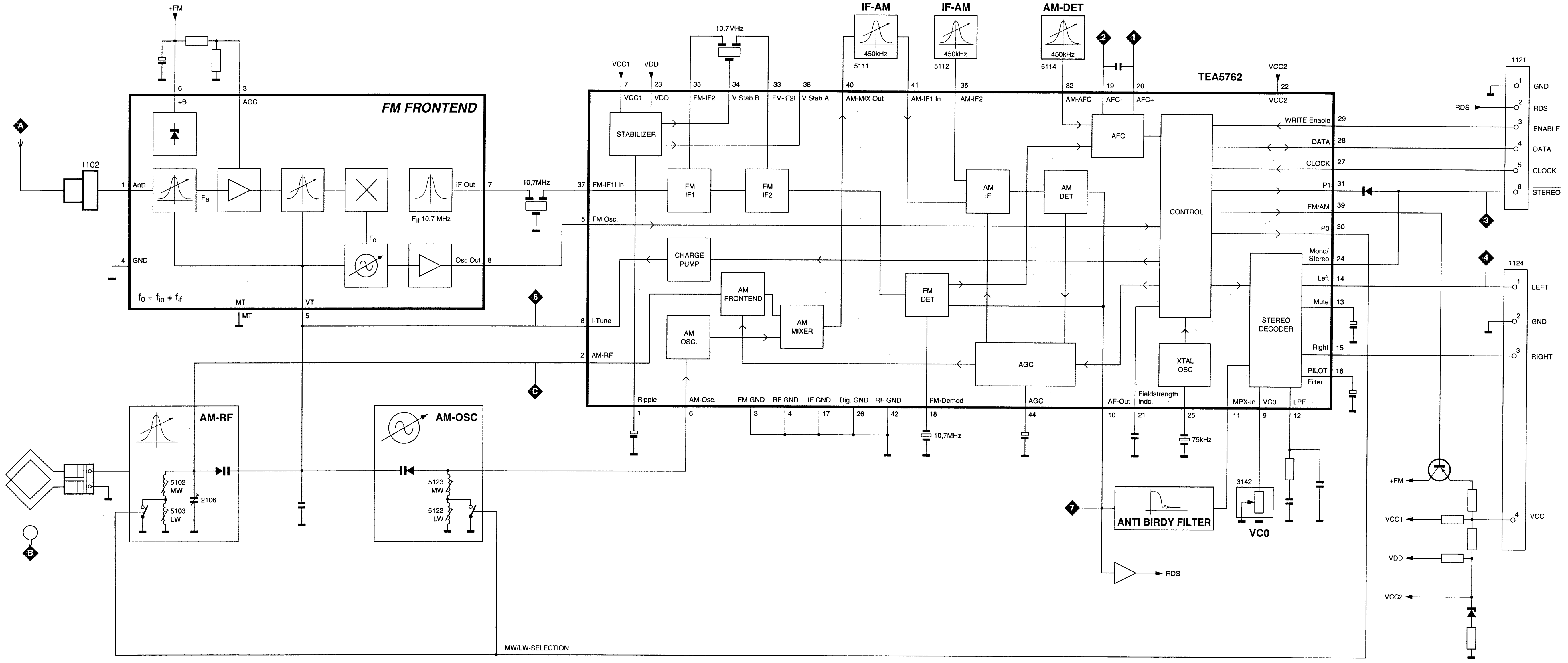
6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

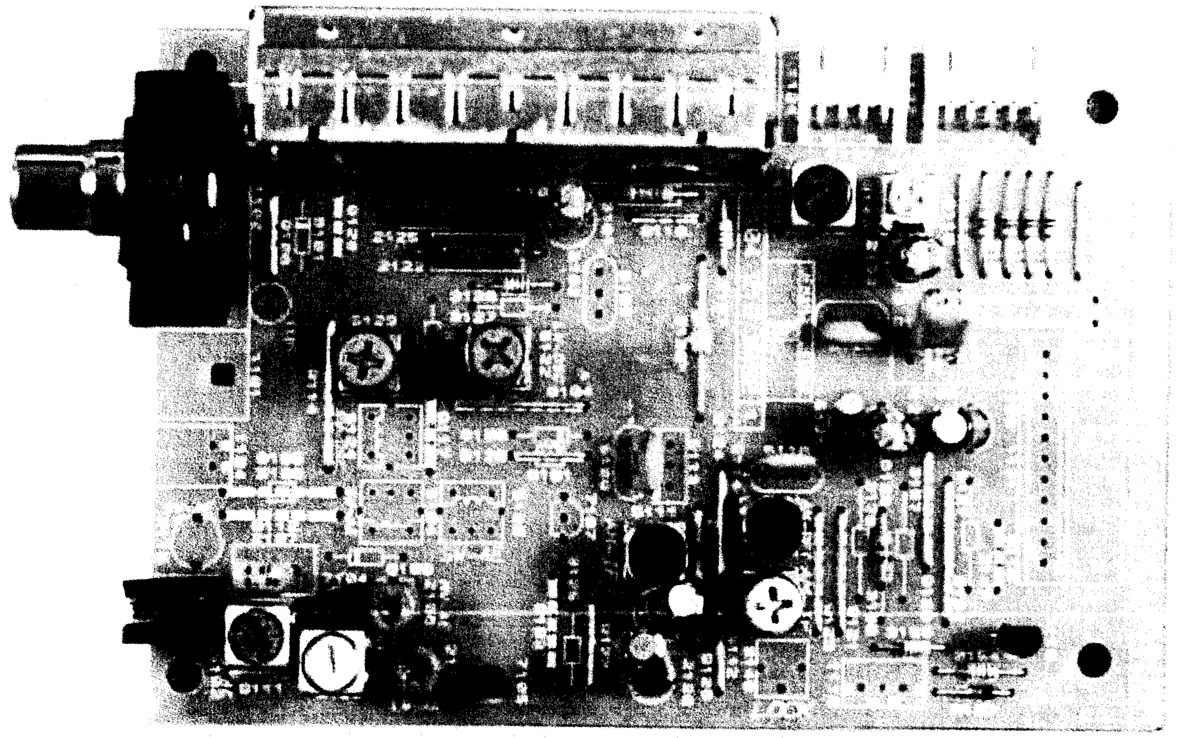
TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

BLOCKDIAGRAM


+FM
FM FRONTEND
+B
AGC
1102
Ant1
GND
Fa
Fo
IF Out
Osc Out
Fif 10,7 MHz
f0 = fin + fif
MT
VT
10,7MHz
TEA5762
VCC1
VDD
VCC2
STABILIZER
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
IF-AM
IF-AM
AM-DET
450kHz
5111
5112
5114
FM-IF1I In
FM Osc.
I-Tune
AM-RF
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AM IF
AM DET
AFC
AGC
CONTROL
XTAL OSC
STEREO DECODER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VC0
LPF
75kHz
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
1124
LEFT
GND
RIGHT
VCC
+FM
VCC1
VDD
VCC2
AM-RF
AM-OSC
5102 MW
5103 LW
2106
5123 MW
5122 LW
ANTI BIRDY FILTER
3142
VC0
RDS
MW/LW-SELECTION
A
B
C
1
2
3
4
6
7



TUNER 95 BOARD

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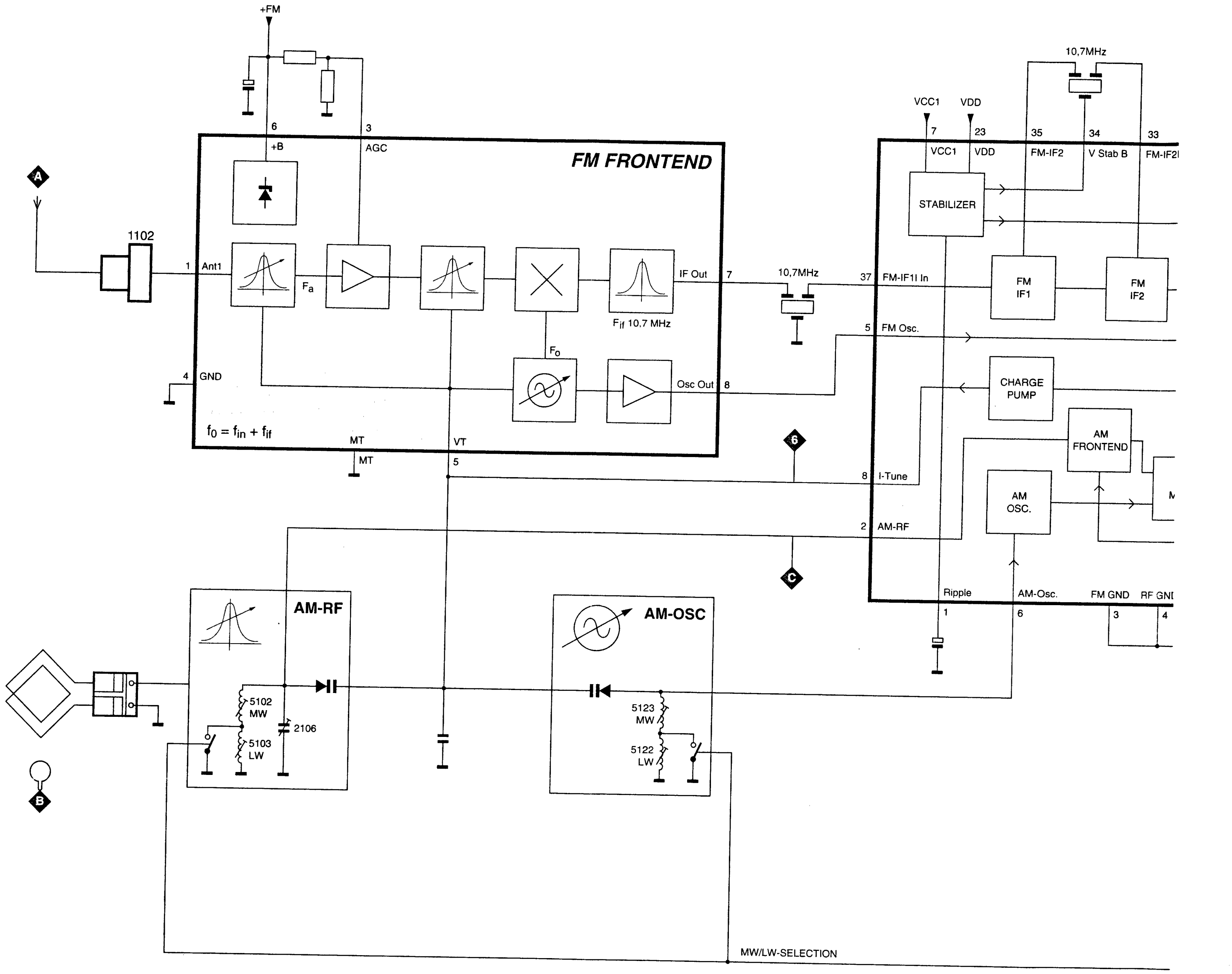
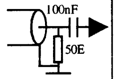
Blockdiagram 7D-1
Adjustmant table 7D-2
Component layout..7D-2
Circuit diagram...7D-3
Partslist 7D-4

BLOCKDIAGRAM



+FM
6
+B
3
AGC
FM FRONTEND
A
1102
1 Ant1
Fa
IF Out 7
Fif 10,7 MHz
Fo
4 GND
Osc Out 8
f0 = fin + fif
MT
MT
VT
5
10,7MHz
10,7MHz
VCC1
VDD
7
23
35
34
33
VCC1
VDD
FM-IF2
V Stab B
FM-IF2
STABILIZER
37 FM-IF1I In
FM IF1
FM IF2
5 FM Osc.
CHARGE PUMP
AM FRONTEND
6
8 I-Tune
AM OSC.
2 AM-RF
C
Ripple
AM-Osc.
FM GND
RF GND
1
6
3
4
AM-RF
5102 MW
5103 LW
2106
B
AM-OSC
5123 MW
5122 LW
MW/LW-SELECTION

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground*	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal		MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave	◇C		5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

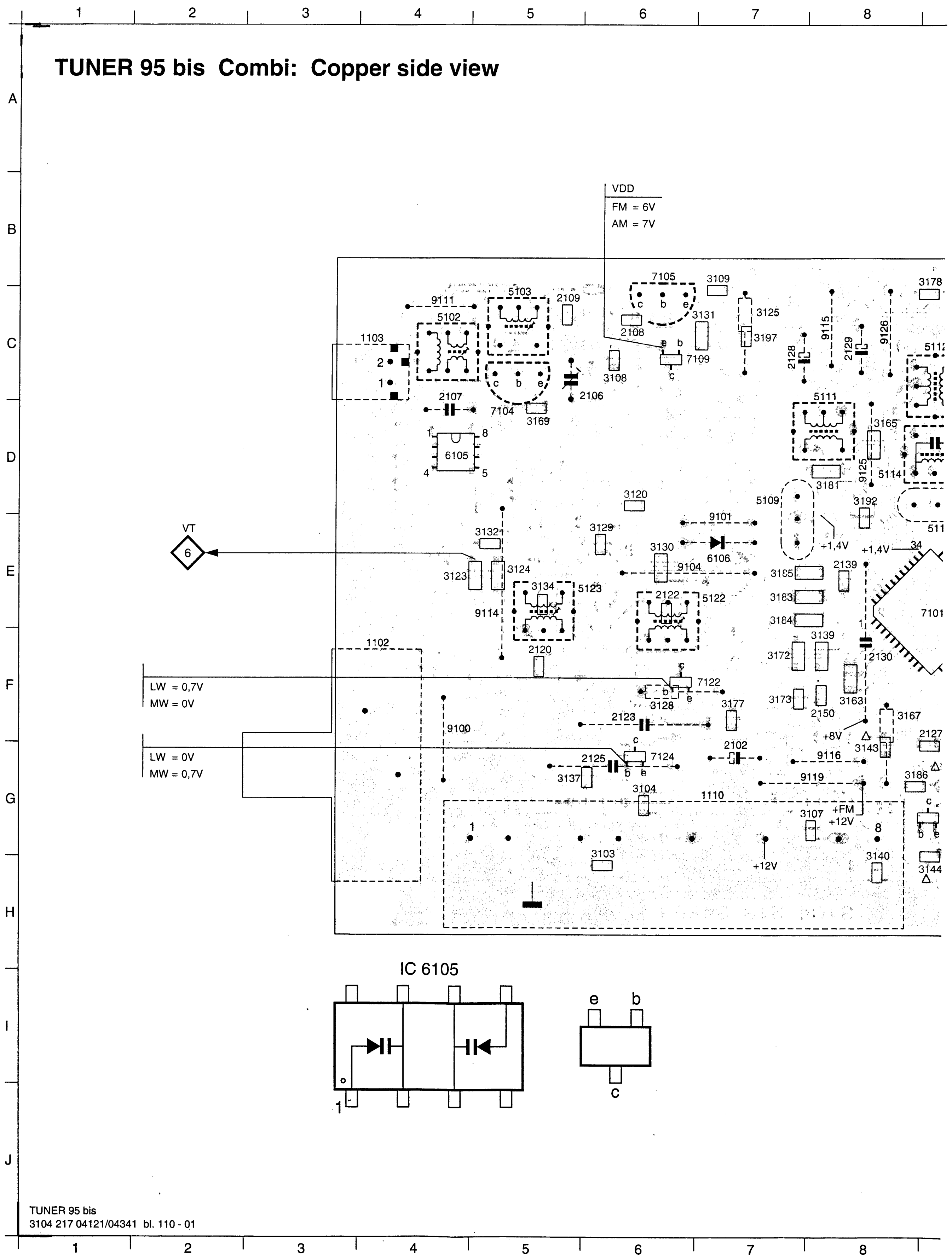
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8

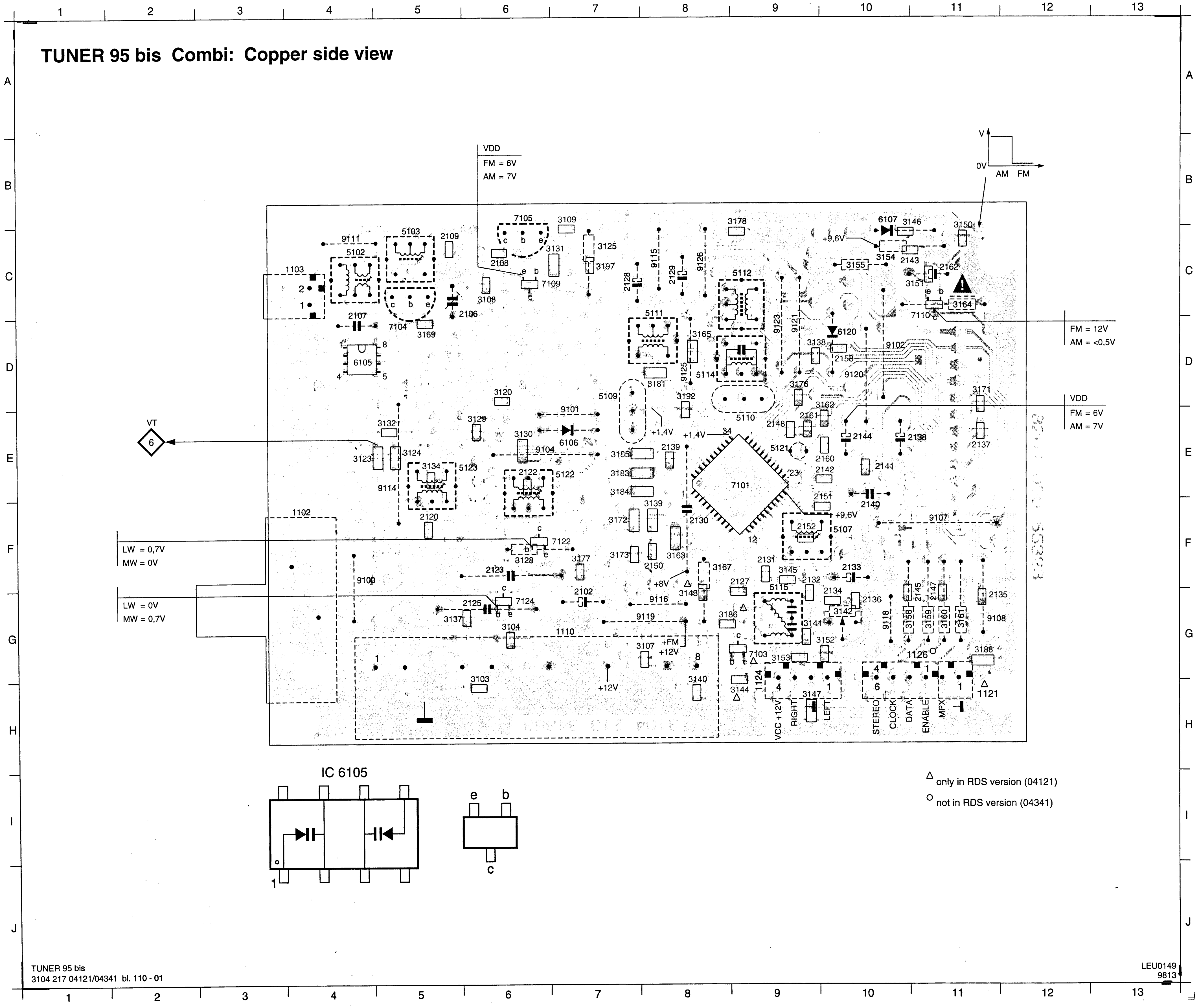
TUNER 95 bis Combi: Copper side view


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
1110
9100
9111
5102
5103
2109
7105
3109
2108
3131
3125
3197
7109
3108
2106
2107
7104
3169
6105
3120
9101
3129
3130
6106
9104
3132
3124
3123
3134
5123
9114
2122
5122
2120
7122
3128
3177
2123
2125
7124
3137
3104
2102
9116
9119
3107
+FM
+12V
3103
+12V
3140
3144
5111
3165
3181
5109
3192
+1,4V
3185
3183
3184
2139
3139
3172
3173
2130
3163
2150
+8V
3143
3167
2127
3186
2128
2129
9115
9126
9125
5114
7101
3178
IC 6105
e
b
c
1

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	3188	G11	5111	C8	6106	E7	7110	D11	9108	G11	9121	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	3192	D8	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8	3197	C7	5114	D8	6120	D10	7124	G6	9114	E5	9125	D8
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	5102	C4	5115	G9	7101	E9	9100	F4	9115	C8	9126	C8
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	5103	C5	5121	E9	7103	G9	9101	E7	9116	G8		
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	5107	F10	5122	E7	7104	D5	9102	D10	9118	G10		
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	5109	D7	5123	E5	7105	B6	9104	E6	9119	G7		
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	5110	E9	6105	D4	7109	C6	9107	F11	9120	D10		

TUNER 95 bis Combi: Copper side view

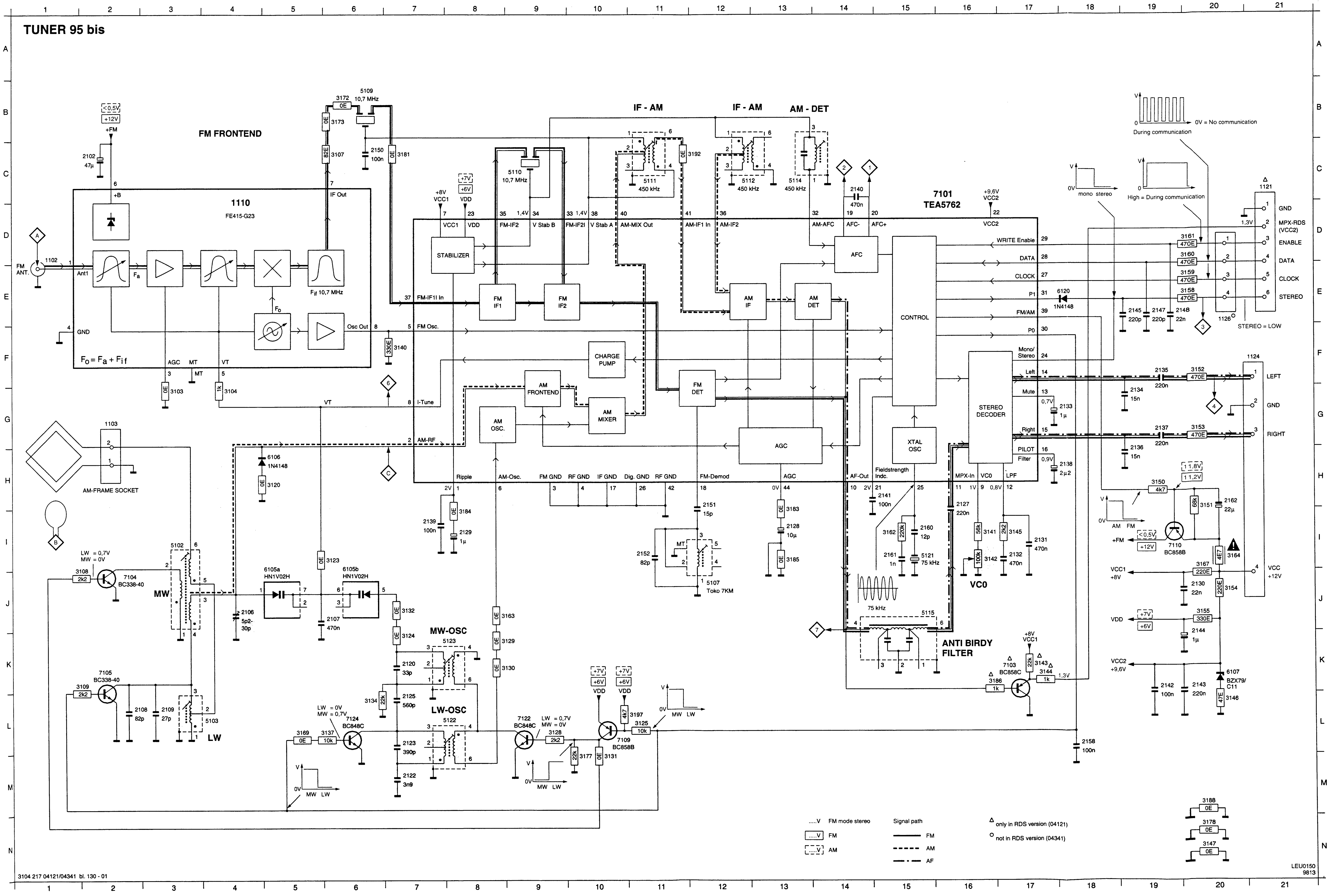

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
VDD
FM = 6V
AM = 7V
V
0V
AM
FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
1110
1124
1126
1121
5102
5103
5107
5109
5110
5111
5112
5114
5115
5121
5122
5123
6105
6106
6107
6120
7101
7103
7104
7105
7109
7110
7122
7124
9100
9101
9102
9104
9107
9108
9111
9114
9115
9116
9118
9119
9120
9121
9123
9125
9126
+9,6V
+1,4V
+8V
+12V
+FM
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
IC 6105
e
b
c
1

△ only in RDS version (04121)

○ not in RDS version (04341)

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2139	I7
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3120	H5
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3147	N20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3178	N20
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6106	H5
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis


FM FRONTEND
1110
FE415-G23
$F_0 = F_a + F_{if}$
F_{if} 10,7 MHz
FM ANT.
1102
Ant1
GND
AGC
MT
VT
IF Out
Osc Out
+FM
+12V
<0,5V
IF - AM
IF - AM
AM - DET
7101
TEA5762
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
FM-IF1I In
FM Osc.
I-Tune
AM-RF
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
5109 10,7 MHz
5110 10,7 MHz
5111 450 kHz
5112 450 kHz
5114 450 kHz
5107 Toko 7KM
5121 75 kHz
75 kHz
VCO
ANTI BIRDY FILTER
5115
AM-FRAME SOCKET
1103
MW
LW
5102
5103
7104 BC338-40
7105 BC338-40
6105a HN1V02H
6105b HN1V02H
6106 1N4148
MW-OSC
5123
LW-OSC
5122
7124 BC848C
7122 BC848C
7109 BC858B
7103 BC858C
7110 BC858B
6120 1N4148
6107 BZX79/ C11
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
MW LW
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
1121
1126
STEREO = LOW
LEFT
GND
RIGHT
1124
VCC1 +8V
VDD
VCC2 +9,6V
VCC +12V
0V = No communication
During communication
High = During communication
mono stereo
AM FM
....V FM mode stereo
FM
AM
Signal path
FM
AM
AF
only in RDS version (04121)
not in RDS version (04341)
3188 0E
3178 0E
3147 0E

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008		0R Jumper 0805
3104	4822 051 10102		1k 2% 0,25W
3107	4822 051 20829		82R 5% 0,1W
3108	4822 117 11449		2k2 1% 0,1W
3109	4822 117 11449		2k2 1% 0,1W
3120	4822 051 20008		0R Jumper 0805
3123	4822 051 10008		0R Jumper 1206
3124	4822 051 10008		0R Jumper 1206
3125	4822 116 83864		10k 5% 0,5W
3128	4822 116 52256		2k2 5% 0,5W
3129	4822 051 20008		0R Jumper 0805
3130	4822 051 10008		0R Jumper 1206
3131	4822 051 10008		0R Jumper 1206
3132	4822 051 20008		0R Jumper 0805
3134	4822 051 20223		22k 5% 0,1W
3137	4822 117 10833		10k 1% 0,1W
3138	4822 051 20008		0R Jumper 0805
3139	4822 051 10008		0R Jumper 1206
3140	4822 051 20331		330R 5% 0,1W
3141	4822 117 11148		56k 1% 0,1W
3142	4822 100 11163		Trimmer 100k 30% 0,1W
3143	4822 051 20223		22k 5% 0,1W
3144	4822 051 10102		1k 2% 0,25W
3145	4822 117 11449		2k2 1% 0,1W
3146	4822 051 20479		47R 5% 0,1W
3147	4822 051 10008		0R Jumper 1206
3150	4822 051 20472		4k7 5% 0,1W
3151	4822 051 20683		68k 5% 0,1W
3152	4822 051 20471		470R 5% 0,1W
3153	4822 051 20471		470R 5% 0,1W
3154	4822 116 83872		220R 5% 0,5W
3155	4822 116 52219		330R 5% 0,5W
3158	4822 116 83883		470R 5% 0,5W
3159	4822 116 83883		470R 5% 0,5W
3160	4822 116 83883		470R 5% 0,5W
3161	4822 116 83883		470R 5% 0,5W
3162	4822 117 13579		220k 1% 0,1W
3163	4822 051 10008		0R Jumper 1206
3164	4822 052 10478	⚠	4R7 5% 0,33W
3165	4822 051 10008		0R Jumper 1206
3167	4822 116 83872		220R 5% 0,5W
3169	4822 051 20008		0R Jumper 0805
3171	4822 051 20008		0R Jumper 0805
3172	4822 051 10008		0R Jumper 1206
3173	4822 051 20008		0R Jumper 0805
3176	4822 051 20008		0R Jumper 0805
3177	4822 051 20223		22k 5% 0,1W
3178	4822 051 10008		0R Jumper 1206
3181	4822 051 10008		0R Jumper 1206
3183	4822 051 10008		0R Jumper 1206
3184	4822 051 10008		0R Jumper 1206
3185	4822 051 10008		0R Jumper 1206
3186	4822 051 10102		1k 2% 0,25W
3188	4822 051 10008		0R Jumper 1206
3192	4822 051 20008		0R Jumper 0805
3197	4822 051 20472		4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial

ELECTRICAL PARTS LIST - TUNER 95 BOARD

5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHZ
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note : Only the parts mentioned in this list are normal
service spare parts.

ETF7 TAPE MODULE

(Non-Dolby Version)

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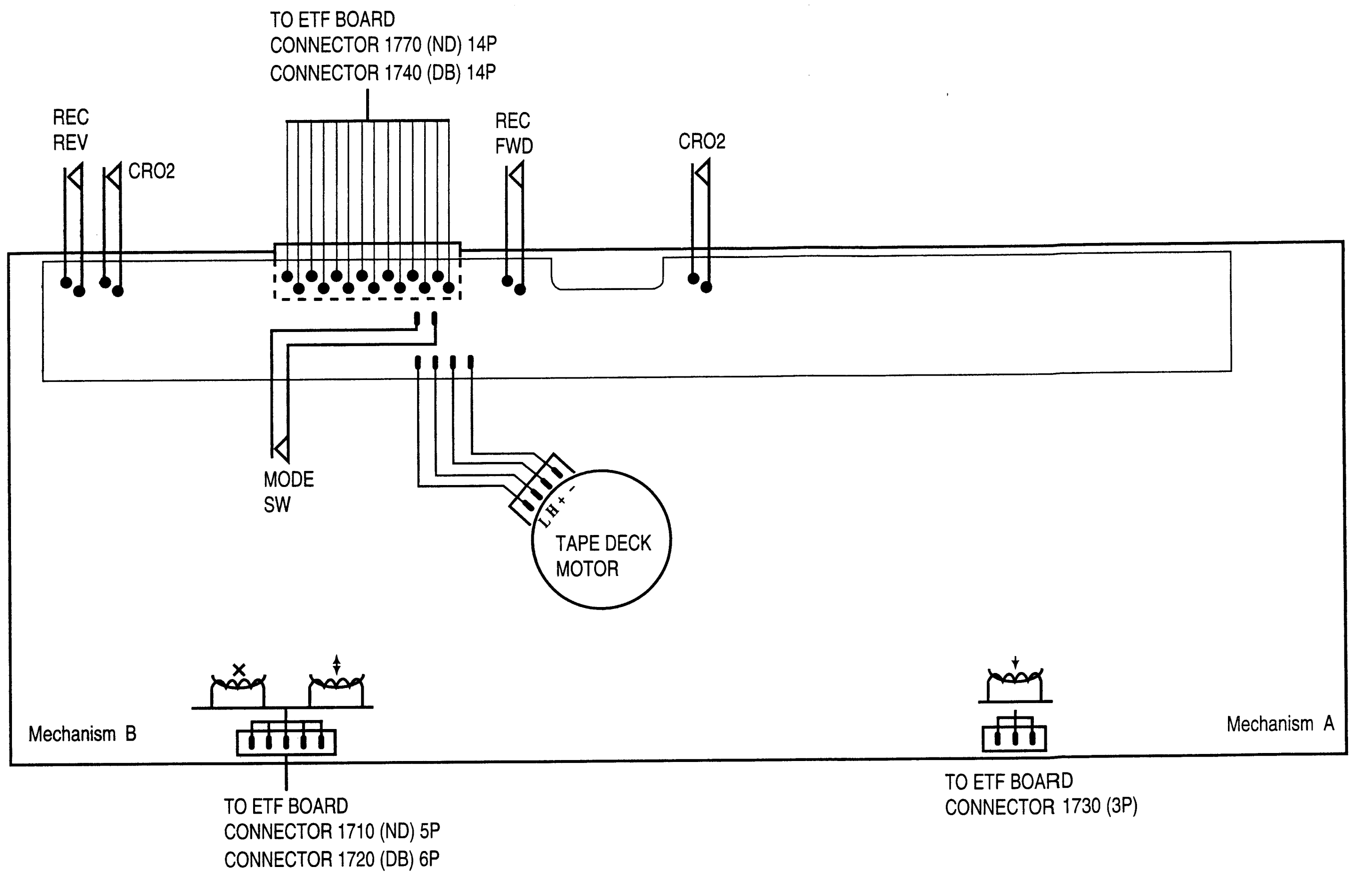
Tapedeck wiring (Double deck)


TO ETF BOARD
CONNECTOR 1770 (ND) 14P
CONNECTOR 1740 (DB) 14P
REC
REV
CRO2
REC
FWD
CRO2
MODE
SW
L H + -
TAPE DECK
MOTOR
Mechanism B
Mechanism A
TO ETF BOARD
CONNECTOR 1710 (ND) 5P
CONNECTOR 1720 (DB) 6P
TO ETF BOARD
CONNECTOR 1730 (3P)

OPTIONS / VARIANTS TABLE

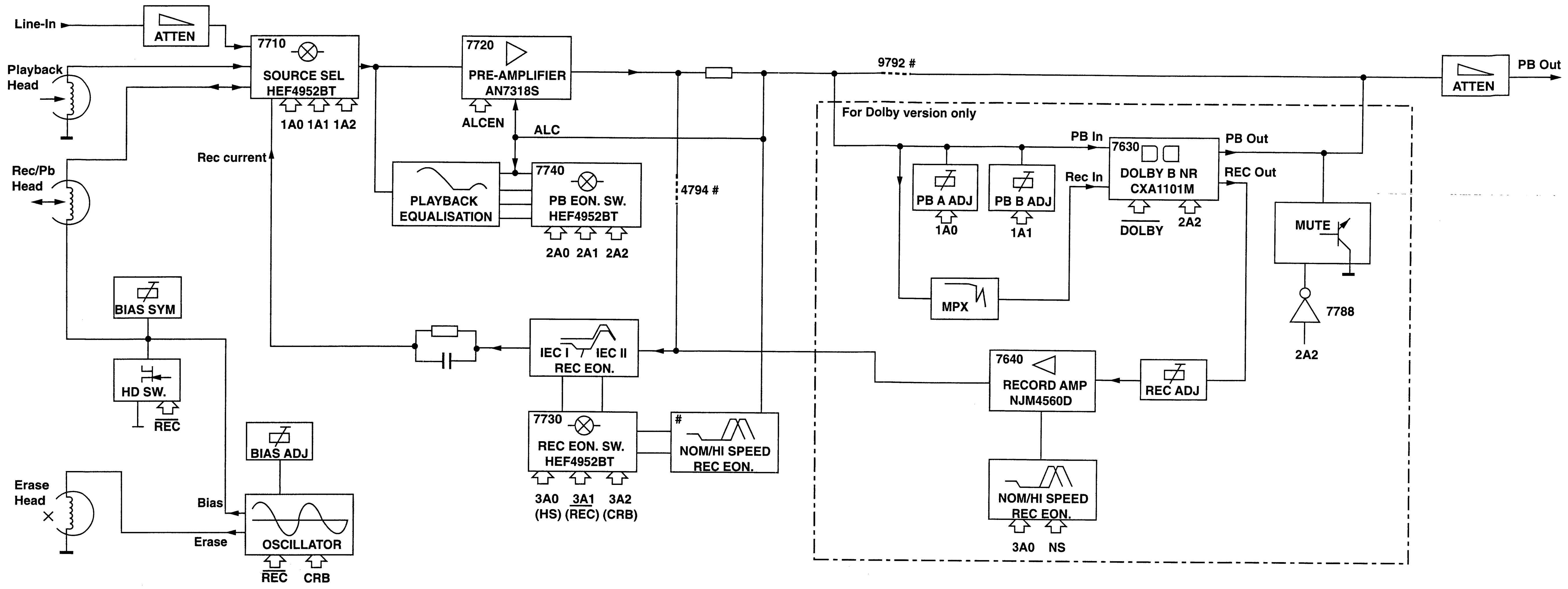
MODULE	ETF7		
VARIANT	**1**	**2**	**3**
FEATURES	**DB/DD/FR**	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double	double
Deck type (Tokyo Pigeon)	CWE	CWE	CWE
Autoreverse	yes (B)	yes (B)	no
Auto Replay	no	no	yes (A+B)
Motor configuration	single	single	single
Auto tape type selection	yes	yes	yes
Dolby type B Noise Reduction	yes	no	no
19 kHz pilot suppression	yes	no	no
Normal / High speed dubbing	yes	yes	no
Cue/Review & Fwd/Rewind	yes	yes	yes

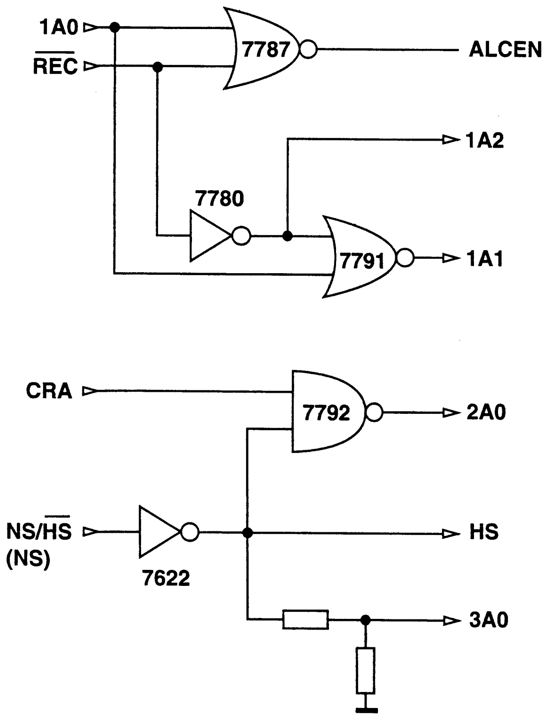
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

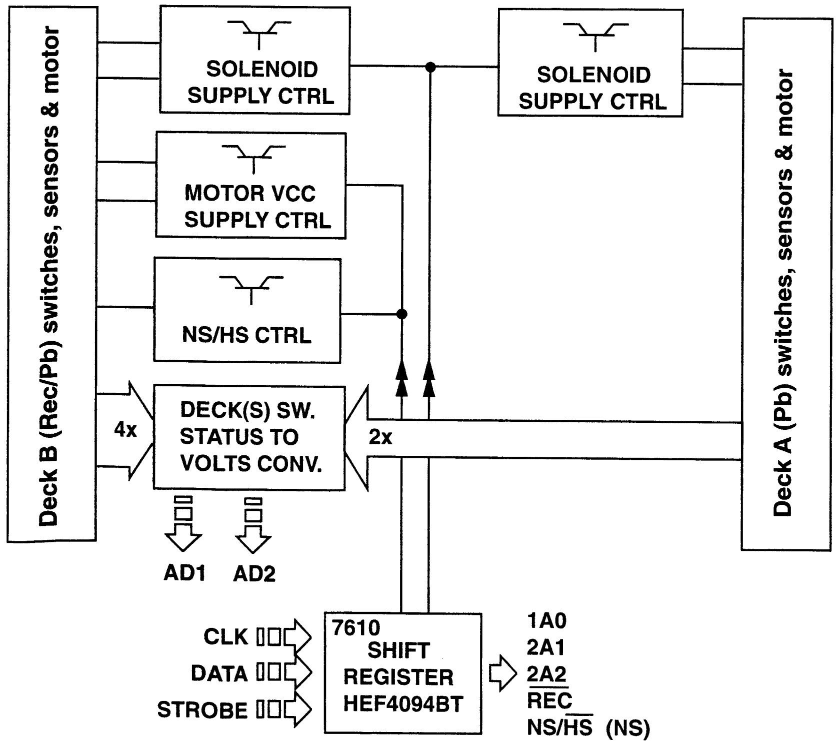
Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
2701 , 2702	150pF	270pF
2703 , 2704	100pF	220pF
2717 , 2718	10nF	15nF
2727 , 2728	470pF	1nF
3616	10k	1k
3618	6k8	-
3620	10k trimmer	-
3622	-	10k trimmer
3672	4k7	-
3676	47k	-
3688	680R	-
3723 , 3724	15k	18k
3727 , 3728	5k6	6k8
3729 , 3730	3k3	4k7
3743 , 3744	1k5	2k2
3745 , 3746	3k3	5k6
3754 , 3755	1M	47R
3769	12k	8k2
3772	6k8	5k6
3774	15k	8k2
6614	1N4148	-
7616	BC857B	-
7622	BC847B	-

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
Rec current
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
PLAYBACK EQUALISATION
7740
PB EQN. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I IEC II
REC EQN.
7640
RECORD AMP
NJM4560D
REC ADJ
7730
REC EQN. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED
REC EQN.
NOM/HI SPEED
REC EQN.
3A0 NS
BIAS ADJ
Erase Head
Bias
Erase
OSCILLATOR
REC CRB


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1 AD2
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) for AF electronics
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5V	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For Non-Dolby version only)***

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For Dolby B NR version only)***

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

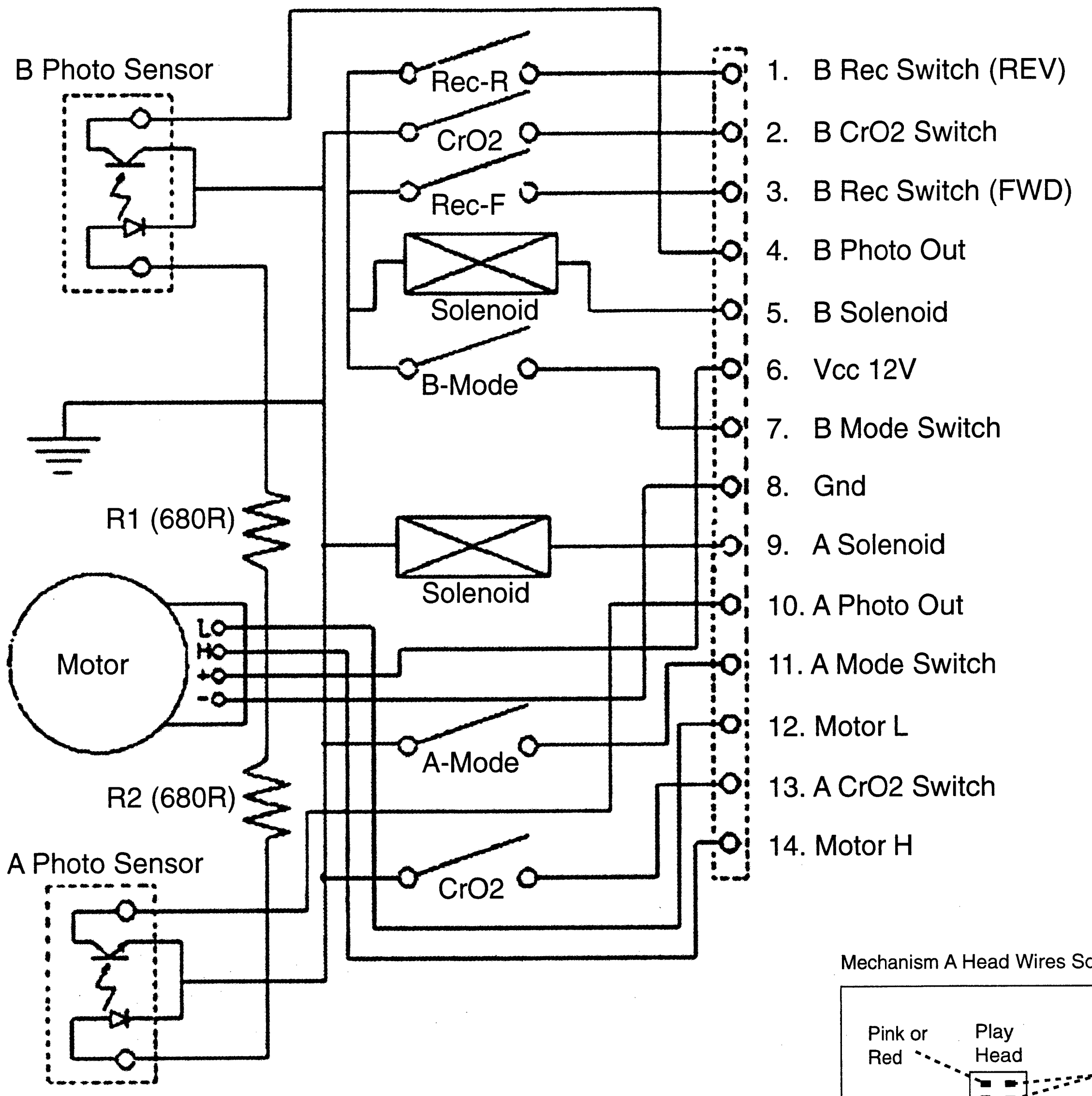
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	SOL A	Solenoid supply for deck A	
○	10	PHOTO A	Photo sensor output (tape movement indication)	
○	11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○	12	L	L pin for motor	
○	13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	14	H	H pin for motor	

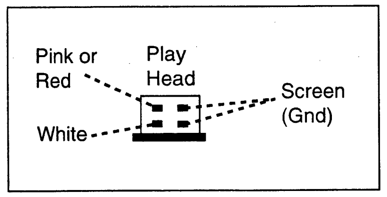
CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	SOL A	Solenoid supply for deck A	
○	10	PHOTO A	Photo sensor output (tape movement indication)	
○	11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○	12	L	L pin for motor	
○	13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	14	H	H pin for motor	

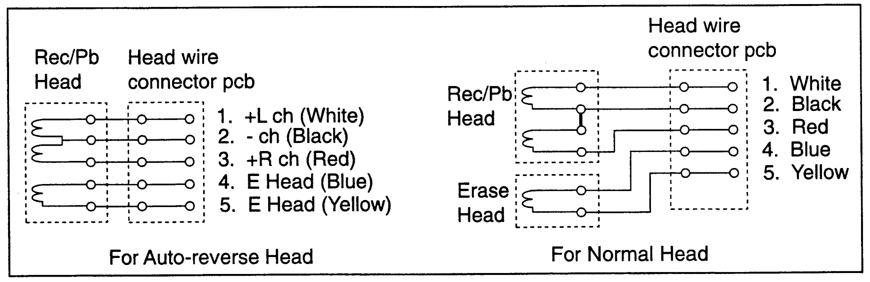
TAPE MECHANISM ELECTRONICS


B Photo Sensor
Rec-R
CrO2
Rec-F
Solenoid
B-Mode
R1 (680R)
Solenoid
Motor
L
H
+
-
A-Mode
R2 (680R)
A Photo Sensor
CrO2
1. B Rec Switch (REV)
2. B CrO2 Switch
3. B Rec Switch (FWD)
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. A Solenoid
10. A Photo Out
11. A Mode Switch
12. Motor L
13. A CrO2 Switch
14. Motor H

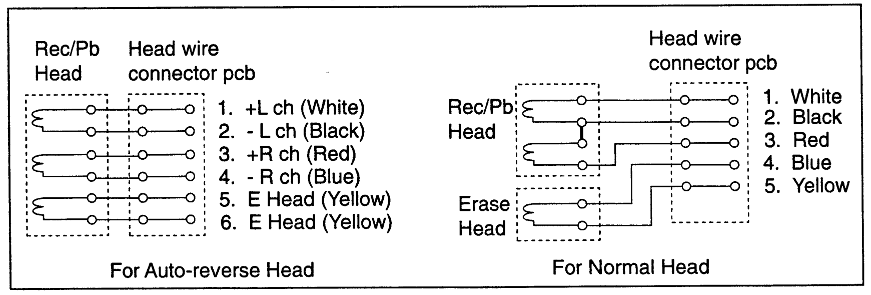
Mechanism A Head Wires Soldering


Pink or Red
Play Head
Screen (Gnd)
White

Mechanism B Head Wires Soldering (Non-Dolby version)


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)
For Auto-reverse Head
Head wire connector pcb
Rec/Pb Head
Erase Head
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

Mechanism B Head Wires Soldering (Dolby B NR version)


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - L ch (Black)
3. +R ch (Red)
4. - R ch (Blue)
5. E Head (Yellow)
6. E Head (Yellow)
For Auto-reverse Head
Head wire connector pcb
Rec/Pb Head
Erase Head
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure

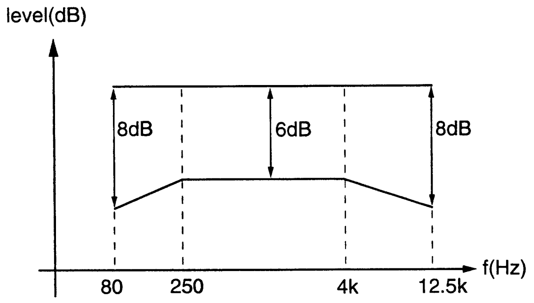


figure. 1

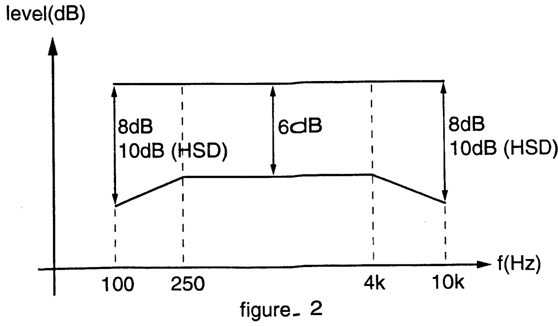
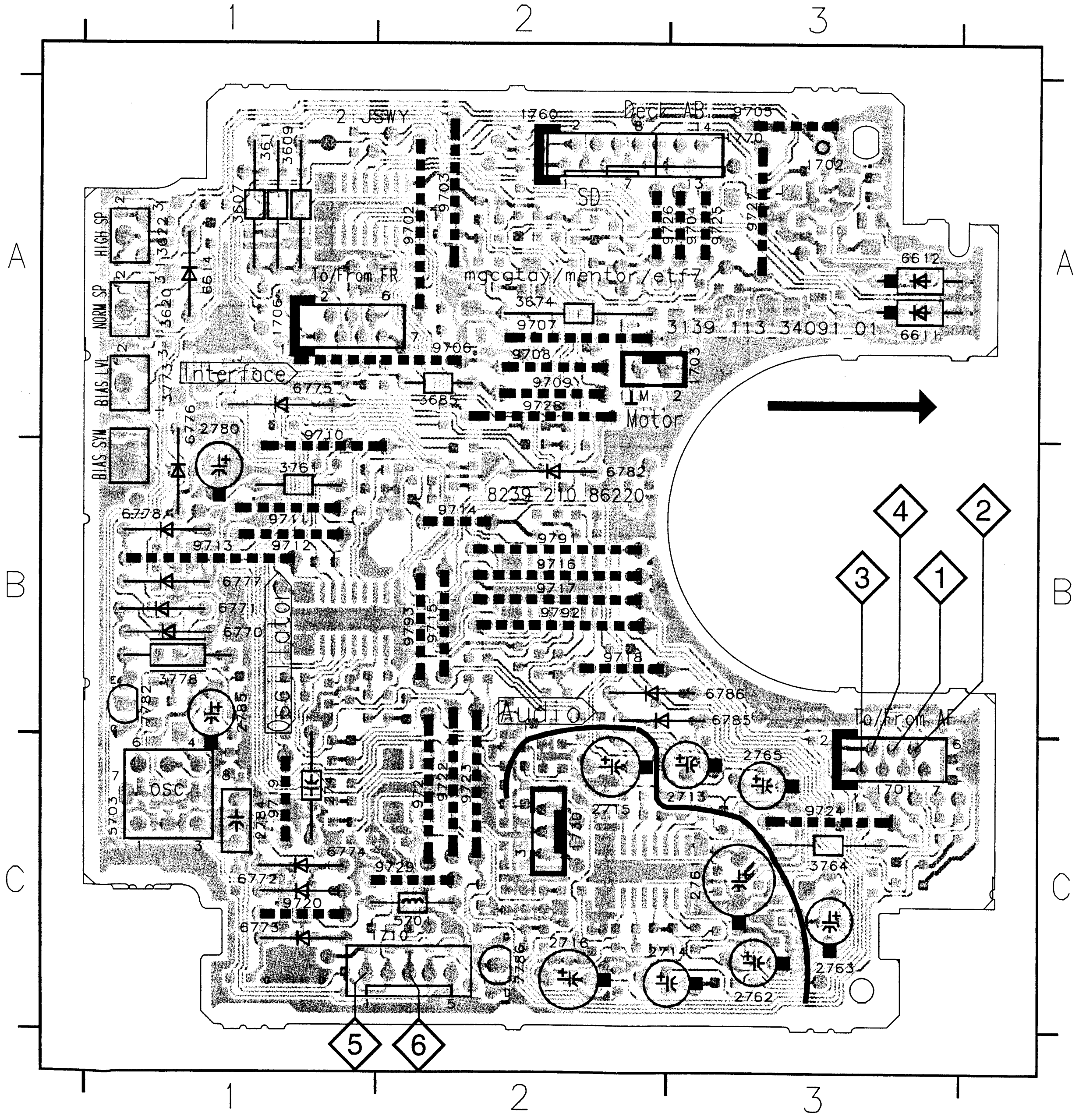


figure. 2

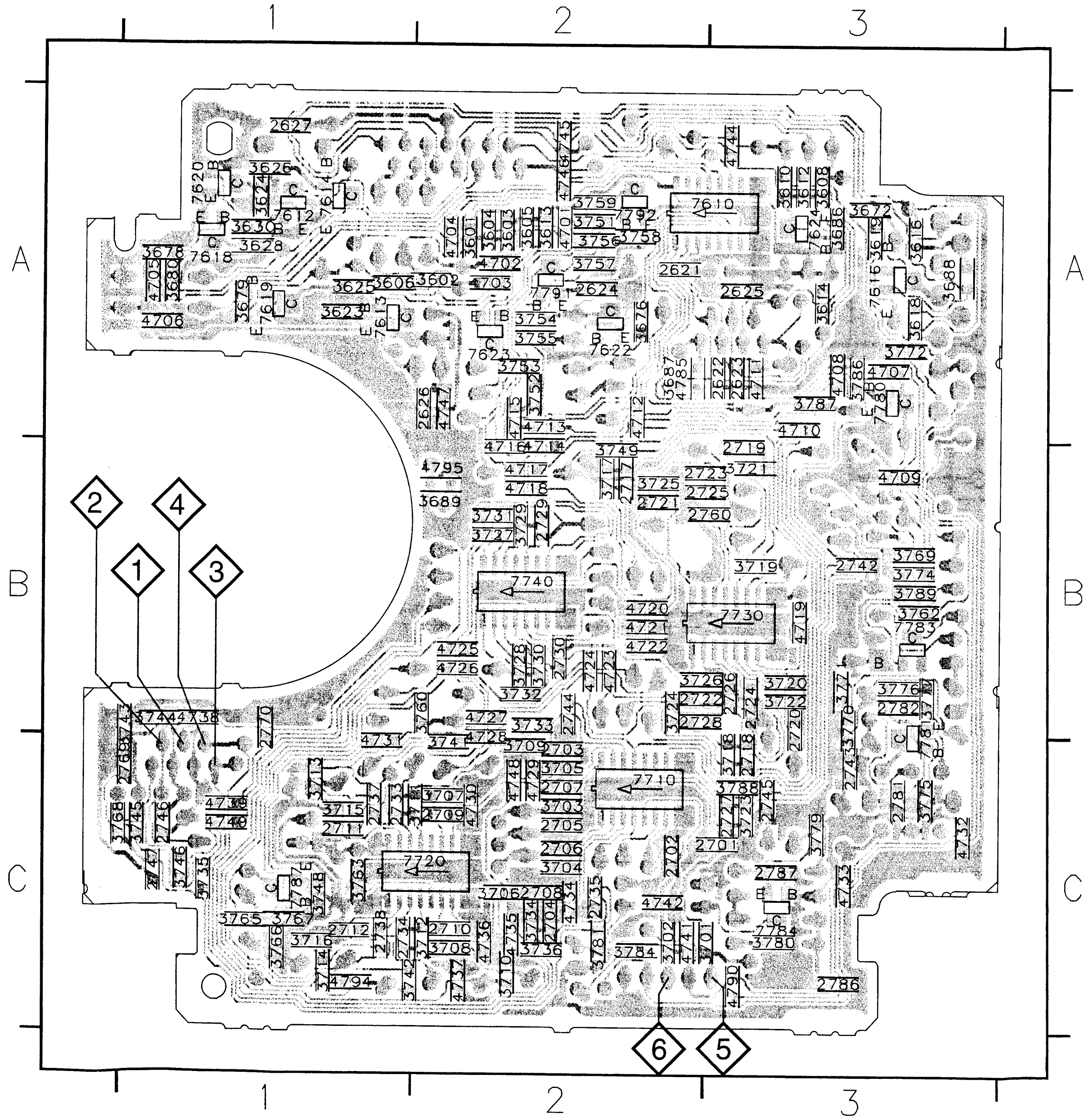
COMPONENT LAYOUT

1701	C3	2715	C2	3607	A1	3778	B1	6774	C1	9702	A2	9712	B1	9722	C2	9793	B2
1702	A3	2716	C2	3609	A1	5701	C2	6775	A1	9703	A2	9713	B1	9723	C2		
1703	A3	2741	C1	3611	A1	5703	C1	6776	A1	9704	A3	9714	B2	9724	C3		
1706	A1	2761	C3	3620	A1	6611	A3	6777	B1	9705	A3	9715	B2	9725	A3		
1710	C2	2762	C3	3622	A1	6612	A3	6778	B1	9706	A2	9716	B2	9726	A2		
1730	C2	2763	C3	3674	A2	6614	A1	6782	B2	9707	A2	9717	B2	9727	A3		
1760	A2	2765	C3	3685	A2	6770	B1	6785	B3	9708	A2	9718	B2	9728	A2		
1770	A3	2780	A1	3761	B1	6771	B1	6786	B3	9709	A2	9719	C1	9729	C2		
2713	C3	2784	C1	3764	C3	6772	C1	7782	B1	9710	A1	9720	C1	9791	B2		
2714	C3	2785	B1	3773	A1	6773	C1	7786	C2	9711	B1	9721	C2	9792	B2		


1
2
3
A
B
C
2 J SWY
1760
Deck AD
9705
1770
1702
SD
HIGH SP
NORM SP
BIAS LVL
BIAS SW
To/From FR
1706
Interface
3685
mecatay/mentor/etf7
3674
9707
3139 113 34091 01
1703
M
Motor
6611
6612
6614
6775
6776
2780
3761
9710
6782
8239 210 86220
9714
9711
9712
9713
6778
6777
6771
6770
9716
9717
9792
9793
Oscillator
3778
OSC
5703
9719
6786
6785
Audio
To/From AF
1701
2765
2713
2715
9724
3764
1730
2761
9720
9729
6772
6774
6773
5701
1710
2716
2714
2762
2763
1
2
3
4
5
6

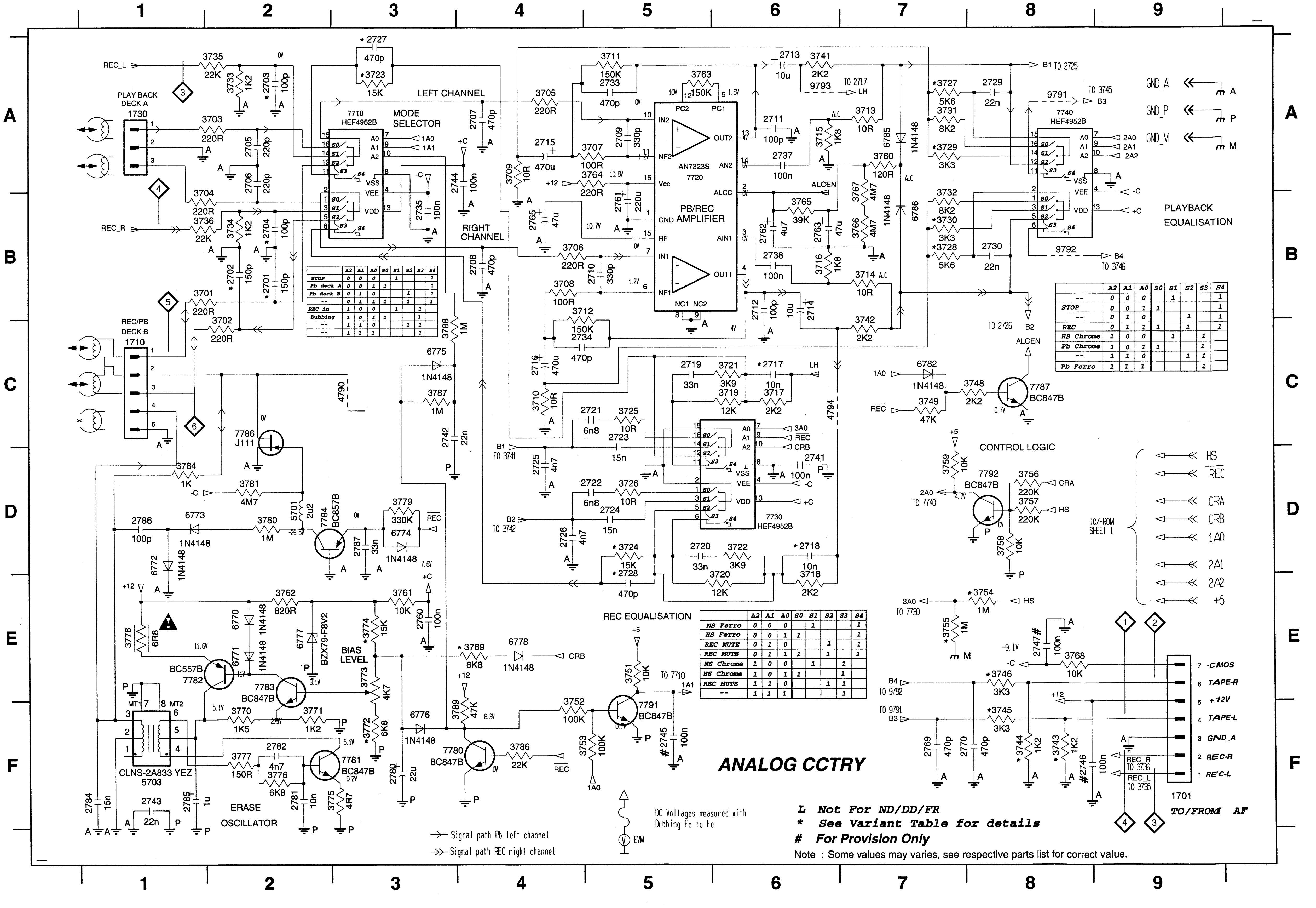
CHIP LAYOUT

2621	A2	2724	B3	3602	A2	3688	A3	3725	B2	3757	A2	4701	A2	4727	B2	7612	A1
2622	A3	2725	B3	3603	A2	3689	B2	3726	B2	3758	A2	4702	A2	4728	C2	7613	A1
2623	A3	2726	B3	3604	A2	3701	C3	3727	B2	3759	A2	4703	A2	4729	C2	7614	A1
2624	A2	2727	C3	3605	A2	3702	C2	3728	B2	3760	B2	4704	A2	4730	C2	7616	A3
2625	A3	2728	B2	3606	A1	3703	C2	3729	B2	3762	B3	4705	A1	4731	C1	7618	A1
2626	A2	2729	B2	3608	A3	3704	C2	3730	B2	3763	C1	4706	A1	4732	C3	7619	A1
2627	A1	2730	B2	3610	A3	3705	C2	3731	B2	3765	C1	4707	A3	4733	C3	7620	A1
2701	C3	2733	C1	3612	A3	3706	C2	3732	B2	3766	C1	4708	A3	4734	C2	7622	A2
2702	C2	2734	C1	3613	A2	3707	C2	3733	B2	3767	C1	4709	B3	4735	C2	7623	A2
2703	C2	2735	C2	3614	A3	3708	C2	3734	C2	3768	C1	4710	A3	4736	C2	7624	A3
2704	C2	2737	C1	3616	A3	3709	C2	3735	C1	3769	B3	4711	A3	4737	C2	7710	C2
2705	C2	2738	C1	3618	A3	3710	C2	3736	C2	3770	B3	4712	A2	4738	B1	7720	C2
2706	C2	2742	B3	3619	A3	3711	C2	3741	C2	3771	B3	4713	A2	4739	C1	7730	B3
2707	C2	2743	C3	3623	A1	3712	C2	3742	C1	3772	A3	4714	B2	4740	C1	7740	B2
2708	C2	2744	B2	3624	A1	3713	C1	3743	B1	3774	B3	4715	A2	4741	C2	7780	A3
2709	C2	2745	C3	3625	A1	3714	C1	3744	B1	3775	C3	4716	B2	4742	C2	7781	B3
2710	C2	2746	C1	3626	A1	3715	C1	3745	C1	3776	B3	4717	B2	4744	A3	7783	B3
2711	C1	2747	C1	3628	A1	3716	C1	3746	C1	3777	B3	4718	B2	4745	A2	7784	C3
2712	C1	2760	B3	3630	A1	3717	B2	3748	C1	3779	C3	4719	B3	4746	A2	7787	C1
2717	B2	2769	C1	3672	A3	3718	C3	3749	B2	3780	C3	4720	B2	4747	A2	7791	A2
2718	C3	2770	B1	3676	A2	3719	B3	3751	A2	3781	C2	4721	B2	4748	C2	7792	A2
2719	B3	2781	C3	3678	A1	3720	B3	3752	A2	3784	C2	4722	B2	4785	A2		
2720	B3	2782	B3	3679	A1	3721	B3	3753	A2	3786	A3	4723	B2	4790	C3		
2721	B2	2786	C3	3680	A1	3722	B3	3754	A2	3787	A3	4724	B2	4794	C1		
2722	B2	2787	C3	3686	A3	3723	C3	3755	A2	3788	C3	4725	B2	4795	B2		
2723	B2	3601	A2	3687	A2	3724	B2	3756	A2	3789	B3	4726	B2	7610	A3		


1
2
3
A
B
C
2627
3626
7620
7612
7614
3630
3628
3678
3680
4705
4706
3679
7618
7619
3625
3606
3502
3623
4701
3604
4702
4703
3759
3757
3754
3755
7623
7622
7610
2621
2625
2624
3772
4707
4709
4710
2719
3721
3725
2723
2721
2760
3719
2742
3769
3774
3789
3762
4795
3689
3731
3727
7740
7730
4720
4721
4722
4725
4726
3776
2782
7710
7720
4742
3784
2787
3780
2786
3765
3767
3716
2712
3706
3704
2706
2705
2707
3703
3705
3709
4794
2770
4744
4738
1
2
3
4
5
6

ANALOG CIRCUIT

1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	


1
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4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1710
7710 HEF4952B
MODE SELECTOR
LEFT CHANNEL
RIGHT CHANNEL
AN7323S 7720
PB/REC AMPLIFIER
IN2
OUT2
NF2
AN2
Vcc
ALCC
GND
RF
AIN1
IN1
OUT1
NF1
NC1 NC2
PC2 PC1
7740 HEF4952B
PLAYBACK EQUALISATION
GND_A
GND_P
GND_M
B1 TO 2725
TO 3745 B3
B4 TO 3746
TO 2717 LH
ALCEN
TO 2726 B2
7787 BC847B
CONTROL LOGIC
7792 BC847B
2A0 TO 7740
CRA
HS
TO/FROM SHEET 1
HS
REC
CRA
CRB
1A0
2A1
2A2
+5
7730 HEF4952B
3A0
REC
CRB
B1 TO 3741
B2 TO 3742
REC EQUALISATION
4794
4790
7786 J111
7784 BC857B
5701 2u2
ERASE OSCILLATOR
CLNS-2A833 YEZ 5703
MT1
MT2
7782 BC557B
7783 BC847B
BZX79-F8V2
BIAS LEVEL
7780 BC847B
7781 BC847B
7791 BC847B
TO 7710 1A1
3A0 TO 7730
1701 TO/FROM AF
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
REC_R TO 3736
REC_L TO 3735
B4 TO 9792
TO 9791 B3
ANALOG CCTRY
DC Voltages measured with Dubbing Fe to Fe
EVM
Signal path Pb left channel
Signal path REC right channel

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For ND/DD/FR

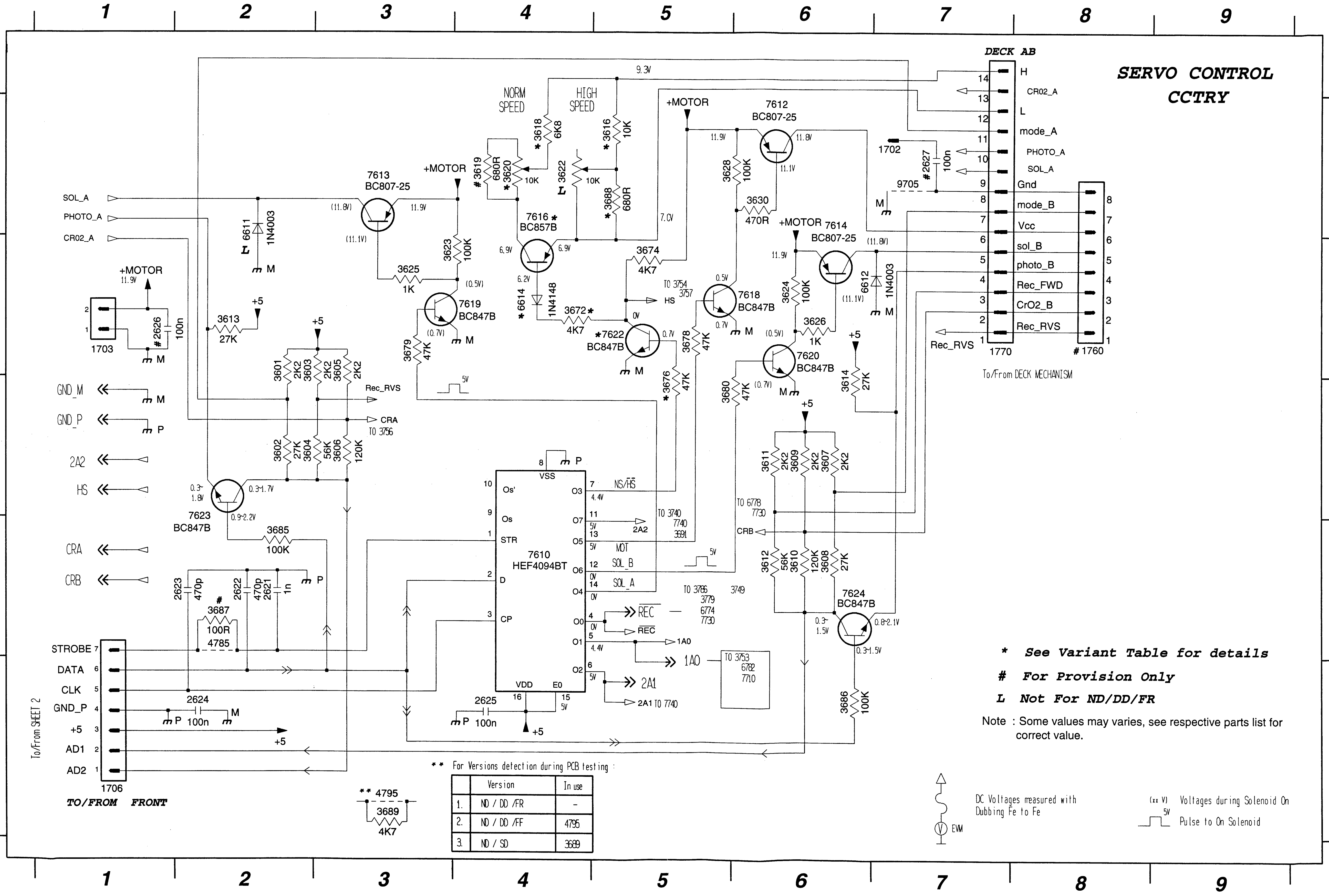
*** See Variant Table for details**

# For Provision Only

Note : Some values may varies, see respective parts list for correct value.

SERVO CONTROL CIRCUIT

1702	A7
1703	B1
1706	E1
1760	B8
1770	B7
2621	D2
2622	D2
2623	D2
2624	E2
2625	E4
2626	B1
2627	A7
3601	B2
3602	C2
3603	B2
3604	C2
3605	B3
3606	C3
3607	C6
3608	D6
3609	C6
3610	D6
3611	C6
3612	D6
3613	B2
3614	C6
3616	A5
3618	A4
3619	A4
3620	A4
3622	A4
3623	B3
3624	B6
3625	B3
3626	B6
3628	A5
3630	A6
3672	B4
3674	B5
3676	C5
3678	B5
3679	B3
3680	C5
3685	D2
3686	E6
3687	D2
3688	A5
3689	E3
4785	D2
4795	E3
6611	A2
6612	B6
6614	B4
7610	D4
7612	A6
7613	A3
7614	A6
7616	A4
7618	B6
7619	B4
7620	B6
7622	B5
7623	D2
7624	D6
9705	A7


1
2
3
4
5
6
7
8
9
A
B
C
D
E
SERVO CONTROL
CCTRY
DECK AB
9.3V
NORM SPEED
HIGH SPEED
+MOTOR
SOL_A
PHOTO_A
CR02_A
7613
BC807-25
(11.8V)
11.9V
(11.1V)
3618 6K8
3616 10K
3619 680R
3620 10K
3622 10K
3688 680R
7616
BC857B
6.9V
6.2V
6614
1N4148
3672 4K7
7622
BC847B
0V
0.7V
3674 4K7
7.0V
TO 3754 3757
HS
7612
BC807-25
11.9V
11.8V
11.1V
3628 100K
3630 470R
7614
BC807-25
(11.8V)
6612
1N4003
(11.1V)
7618
BC847B
0.5V
3624 100K
3626 1K
7620
BC847B
(0.5V)
(0.7V)
3614 27K
3678 47K
3676 47K
3680 47K
1702
2627 100n
9705
M
Rec_RVS
6611
1N4003
L
3623 100K
3625 1K
7619
BC847B
(0.5V)
(0.7V)
3679 47K
5V
+MOTOR
11.9V
1703
2626 100n
3613 27K
+5
3601 2K2
3603 2K2
3605 2K2
Rec_RVS
CRA
TO 3756
3602 27K
3604 56K
3606 120K
GND_M
GND_P
2A2
HS
CRA
CRB
7623
BC847B
0.3-1.8V
0.3-1.7V
0.9-2.2V
3685 100K
2623 470p
2622 470p
2621 1n
3687 100R
4785
P
7610
HEF4094BT
VSS
Os'
Os
STR
D
CP
VDD
EO
O3
O7
O5
O6
O4
O0
O1
O2
NS/HS
2A2
MOT
SOL_B
SOL_A
TO 3740 7740 3691
REC
1A0
2A1
2A1 TO 7740
TO 3753 6782 7710
TO 3765 3779 6774 7730 3749
2625 100n
2624 100n
+5
STROBE
DATA
CLK
GND_P
AD1
AD2
1706
TO/FROM FRONT
To/From SHEET 2
3611 2K2
3609 2K2
3607 2K2
TO 6778 7730
CRB
3612 56K
3610 120K
3608 27K
7624
BC847B
0.3-1.5V
0.8-2.1V
0.3-1.5V
3686 100K
H
CR02_A
L
mode_A
PHOTO_A
SOL_A
Gnd
mode_B
Vcc
sol_B
photo_B
Rec_FWD
CrO2_B
Rec_RVS
1770
1760
To/From DECK MECHANISM
4795
3689 4K7
EVM

* See Variant Table for details

# For Provision Only

L Not For ND/DD/FR

Note : Some values may varies, see respective parts list for correct value.

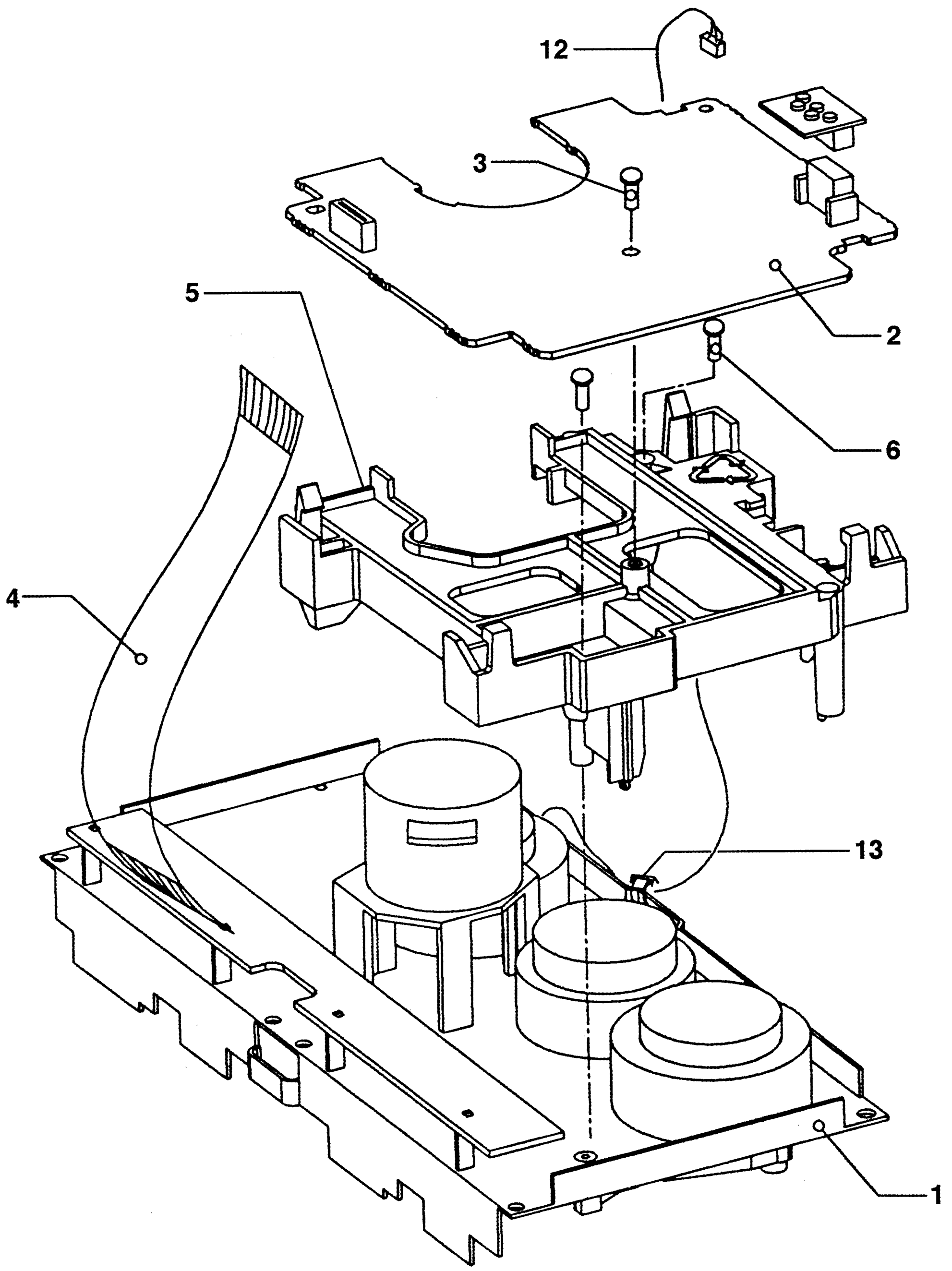
DC Voltages measured with Dubbing Fe to Fe

(xx V) Voltages during Solenoid On

5V Pulse to On Solenoid

** For Versions detection during PCB testing :

	Version	In use
1.	ND / DD /FR	-
2.	ND / DD /FF	4795
3.	ND / SD	3689

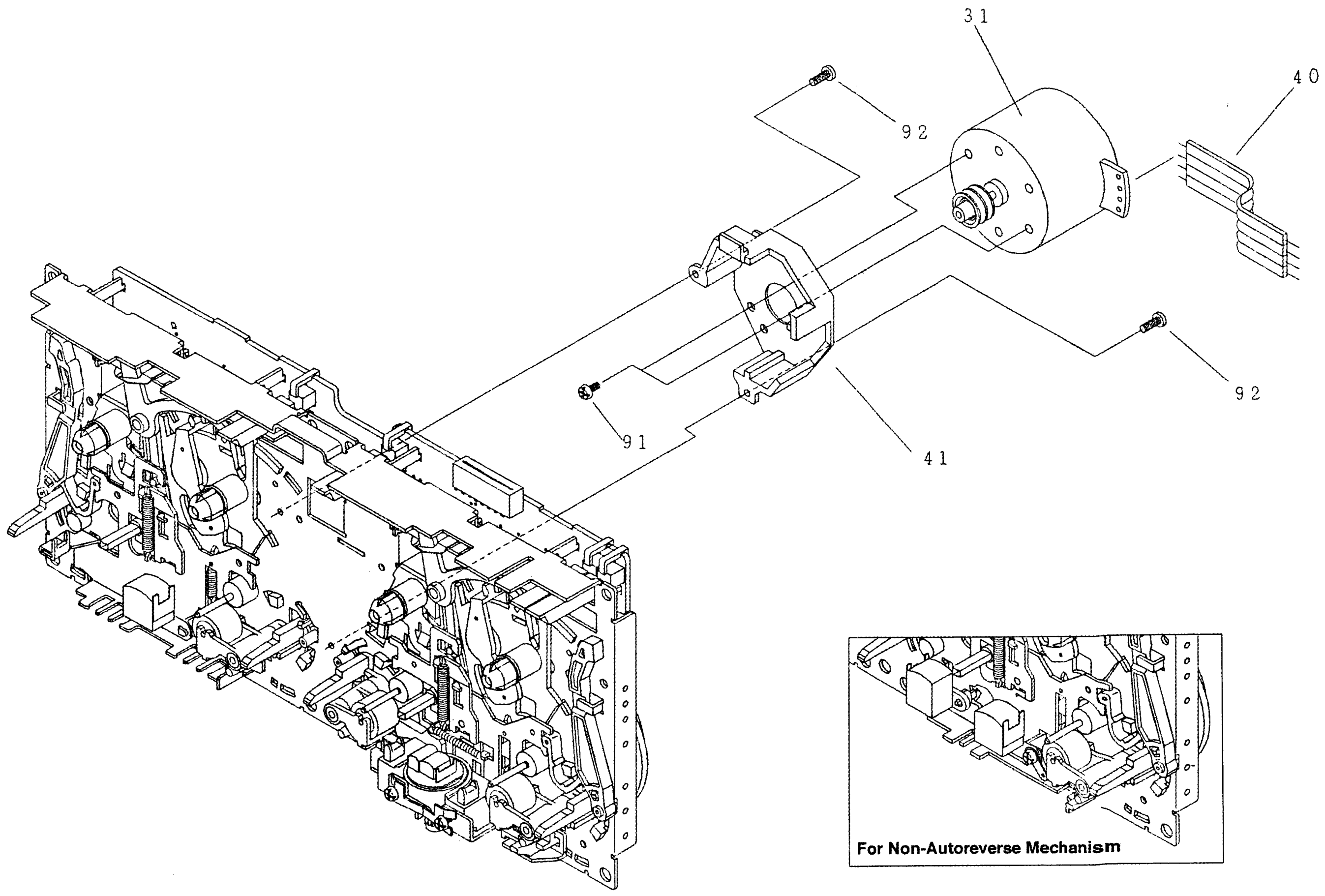

12
3
5
2
6
4
13
1

3139 118 77070 (Incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

1	313911877130	Autoreverse Mech. CWE44FR01
1	313911877140	Non-Autoreverse Mech. CWE44FF02
3	-	Screw D3 x 10
6	-	Screw M2 x 16
7	313911034080	Flex Cable 14 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.


31
40
92
92
91
41
For Non-Autoreverse Mechanism

TAPE MECHANISM - MOTOR EXPLODED VIEW

31	4822 361 11055	Motor Assembly
91	-	Screw M2,6 x 5
92	-	Screw M2 x 5

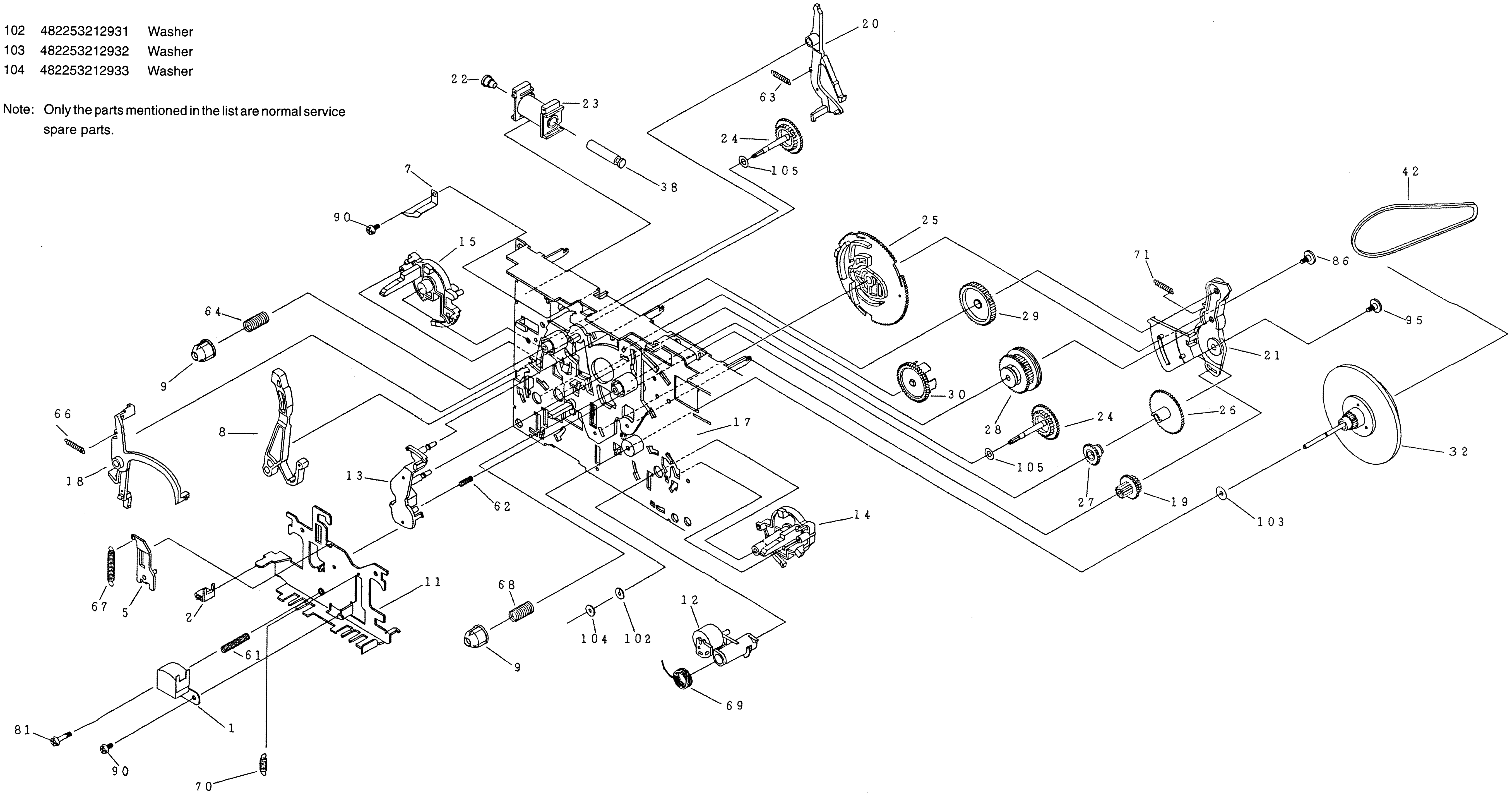
Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	996500002313	Play Head (Non-Autoreverse deck)
1	996500002321	Play Head (Autoreverse deck)
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
42	996500002315	Belt AF (Autoreverse deck)
42	996500002718	Belt AF (Non-autoreverse deck)
69	482249211761	Spring
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.

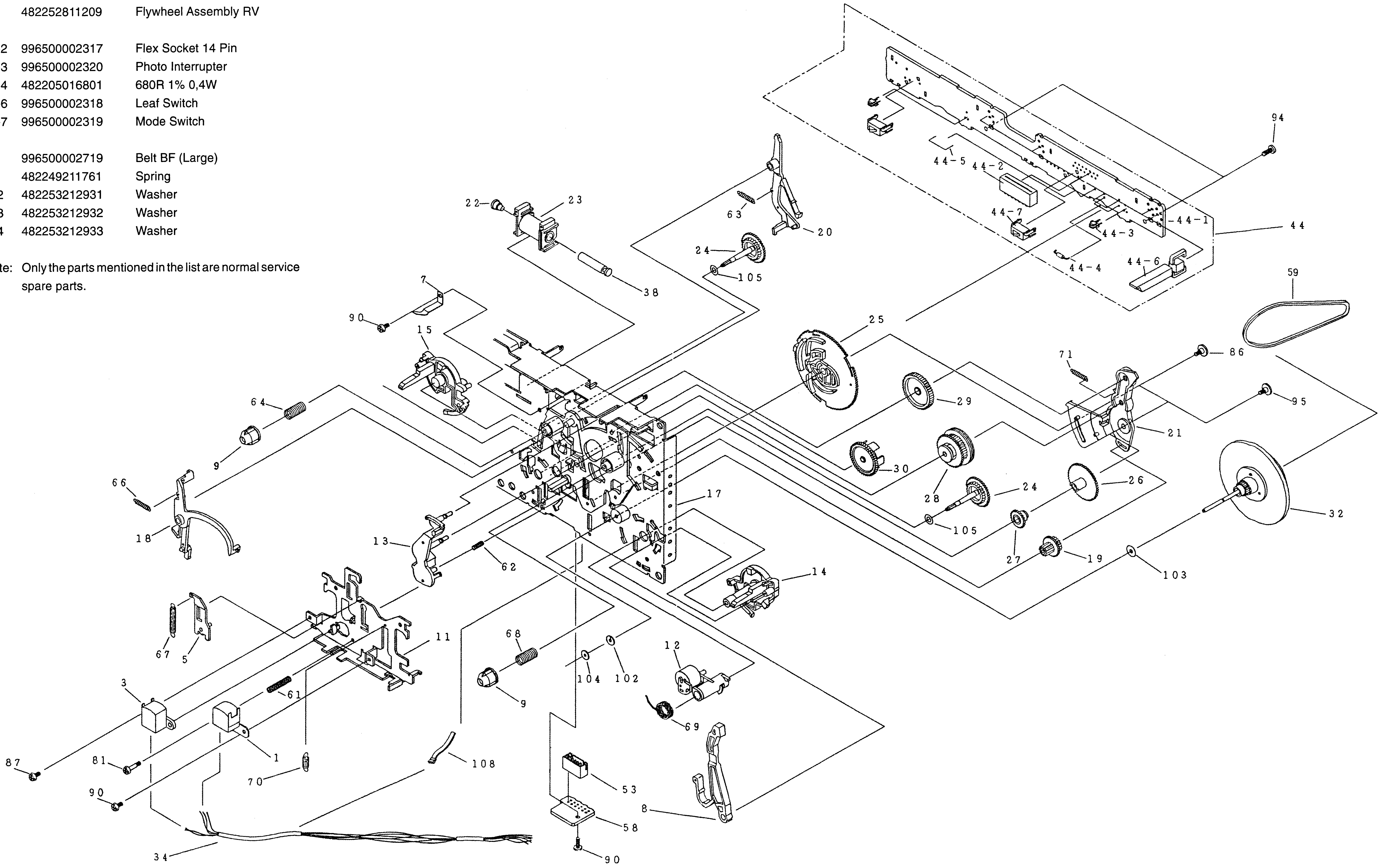

20
22
23
63
24
105
38
7
90
42
25
71
86
15
64
29
95
21
9
30
66
8
17
28
24
26
32
105
18
13
62
27
19
103
14
11
68
12
67
5
2
104
102
61
9
69
81
1
90
70

TAPE MECHANISM B - RECORD/PLAYBACK *(Non-Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

1	996500002313	Play Head
3	996500002600	Head, Erase
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
44-2	996500002317	Flex Socket 14 Pin
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002319	Mode Switch
59	996500002719	Belt BF (Large)
69	482249211761	Spring
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.

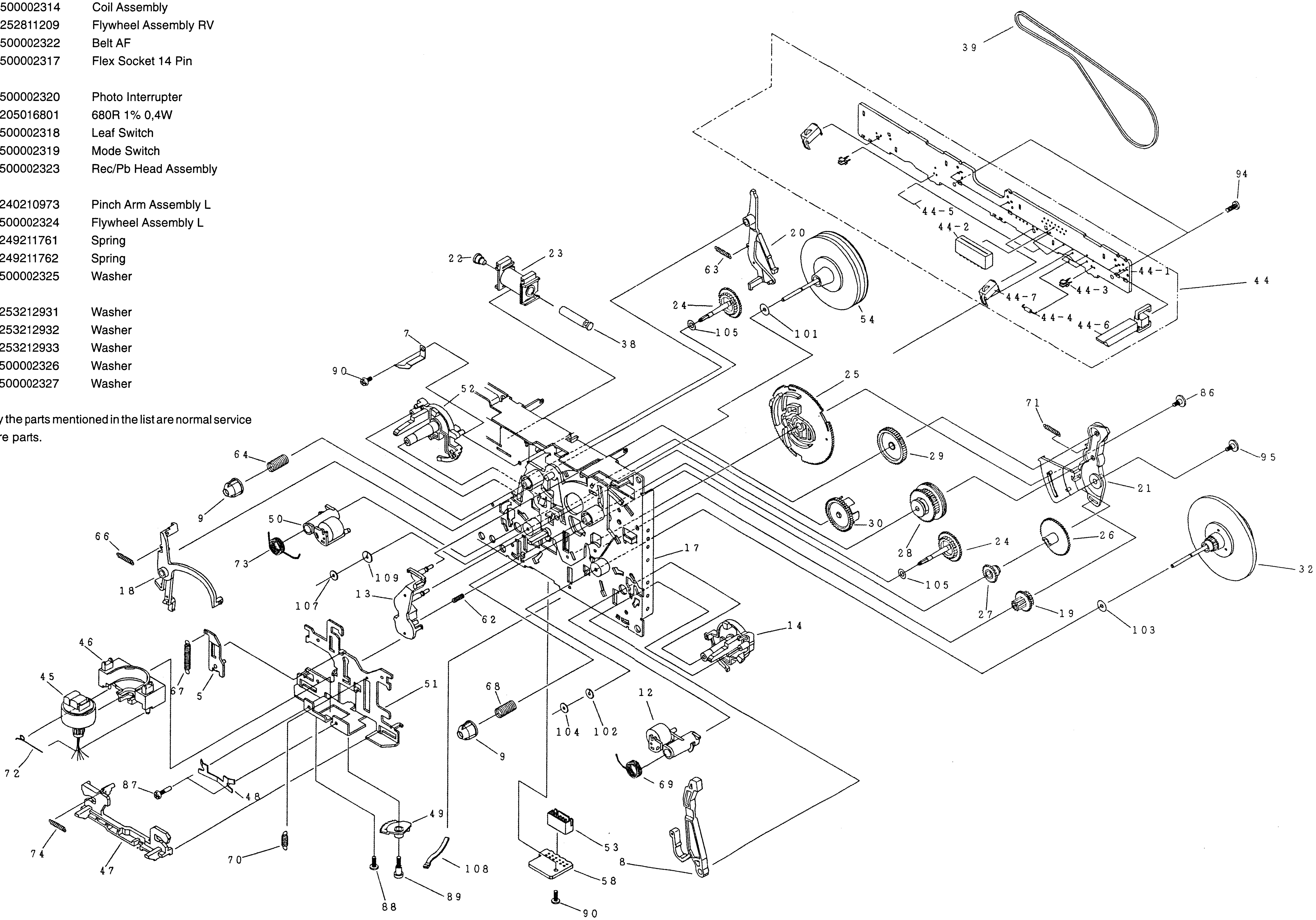

94
44-5
44-2
44-7
44-1
44-3
44-4
44-6
44
59
22
23
63
20
24
105
38
7
90
15
25
71
86
95
29
21
64
9
30
28
24
26
66
17
105
32
18
13
62
27
19
103
14
67
5
11
68
12
104
102
3
61
9
69
1
87
81
70
108
53
90
8
58
34
90

TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
39	996500002322	Belt AF
44-2	996500002317	Flex Socket 14 Pin
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002319	Mode Switch
45	996500002323	Rec/Pb Head Assembly
50	482240210973	Pinch Arm Assembly L
54	996500002324	Flywheel Assembly L
69	482249211761	Spring
73	482249211762	Spring
101	996500002325	Washer
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer
107	996500002326	Washer
109	996500002327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.


39
94
44-5
44-2
44-1
44
44-3
44-7
44-4
44-6
20
63
54
24
105
101
22
23
38
7
90
52
25
71
86
29
95
21
64
9
66
50
73
109
107
13
18
62
17
30
28
24
26
32
105
27
19
103
14
46
45
67
5
51
68
12
104
102
9
72
87
48
69
49
53
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74
70
47
108
88
89
58
90

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.
1706	482226710953	Flex Socket 7pin Vert.
1770	482226751255	Flex Socket 14pin Vert.

CAPACITORS

2621	532212231647	1nF 10% 63V	
2622	532212234099	470pF 10% 63V	
2623	532212234099	470pF 10% 63V	
2624	482212614585	100nF 10% 50V	
2625	482212614585	100nF 10% 50V	
2701	532212233538	150pF 2% 63V	Autoreverse
2701	482212233216	270pF 5% 63V	Non-autoreverse
2702	532212233538	150pF 2% 63V	Autoreverse
2702	482212233216	270pF 5% 63V	Non-autoreverse
2703	532212232531	100pF 5% 50V	Autoreverse
2703	482212233575	220pF 5% 63V	Non-autoreverse
2704	532212232531	100pF 5% 50V	Autoreverse
2704	482212233575	220pF 5% 63V	Non-autoreverse
2705	482212233575	220pF 5% 63V	
2706	482212233575	220pF 5% 63V	
2707	532212234099	470pF 10% 63V	
2708	532212234099	470pF 10% 63V	
2709	532212231863	330pF 5% 63V	
2710	532212231863	330pF 5% 63V	
2711	532212232531	100pF 5% 50V	
2712	532212232531	100pF 5% 50V	
2713	482212440248	10µF 20% 63V	
2714	482212440248	10µF 20% 63V	
2715	482212480195	470µF 20% 10V	
2716	482212480195	470µF 20% 10V	
2717	482212233177	10nF 20% 50V	Autoreverse
2717	482212613188	15nF 5% 63V	Non-autoreverse
2718	482212233177	10nF 20% 50V	Autoreverse
2718	482212613188	15nF 5% 63V	Non-autoreverse
2719	482212612105	33nF 5% 50V	
2720	482212612105	33nF 5% 50V	
2721	532212231866	6,8nF 10% 63V	
2722	532212231866	6,8nF 10% 63V	
2723	482212613188	15nF 5% 63V	
2724	482212613188	15nF 5% 63V	
2725	532212610223	4,7nF 10% 63V	
2726	532212610223	4,7nF 10% 63V	
2727	532212234099	470pF 10% 63V	Autoreverse
2727	532212231647	1nF 10% 63V	Non-autoreverse
2728	532212234099	470pF 10% 63V	Autoreverse
2728	532212231647	1nF 10% 63V	Non-autoreverse
2729	532212232654	22nF 10% 63V	
2730	532212232654	22nF 10% 63V	
2733	532212234099	470pF 10% 63V	
2734	532212234099	470pF 10% 63V	
2735	482212614585	100nF 10% 50V	
2737	482212614585	100nF 10% 50V	
2738	482212614585	100nF 10% 50V	
2741	482212611585	22nF +80/-20% 25V	
2742	532212232654	22nF 10% 63V	
2743	532212232654	22nF 10% 63V	
2744	482212614585	100nF 10% 50V	
2760	482212614585	100nF 10% 50V	
2761	482212480144	220µF 20% 25V	
2762	482212440769	4,7µF 20% 100V	
2763	482212440433	47µF 20% 25V	
2765	482212440433	47µF 20% 25V	
2769	532212234099	470pF 10% 63V	
2770	532212234099	470pF 10% 63V	
2780	482212481151	22µF 20% 50V	
2781	482212233177	10nF 20% 50V	
2782	532212610223	4,7nF 10% 63V	
2784	482212151305	15nF 10% 50V	
2785	482212421913	1µF 20% 63V	
2786	532212232531	100pF 5% 50V	
2787	482212612105	33nF 5% 50V	

RESISTORS

3601	482211711449	2k2 1% 0,1W	
3602	482205120273	27k 5% 0,1W	
3603	482211711449	2k2 1% 0,1W	
3604	482211711148	56k 1% 0,1W	
3605	482211711449	2k2 1% 0,1W	
3606	482205120124	120k 5% 0,1W	
3607	482211652256	2k2 5% 0,5W	
3608	482205120273	27k 5% 0,1W	
3609	482211652256	2k2 5% 0,5W	
3610	482205120124	120k 5% 0,1W	
3611	482211652256	2k2 5% 0,5W	
3612	482211711148	56k 1% 0,1W	
3613	482205120273	27k 5% 0,1W	
3614	482205120273	27k 5% 0,1W	
3616	482211710833	10k 1% 0,1W	Autoreverse
3616	482205110102	1k 2% 0,25W	Non-autoreverse
3618	482211711507	6k8 1% 0,1W	Autoreverse
3620	482210011141	Trimmer 10k 30% 0,1W	Autorev.
3622	482210011141	Trimmer 10k30% 0,1W	Non-autorev.
3623	482211710837	100k 1% 0,1W	
3624	482211710837	100k 1% 0,1W	
3625	482205110102	1k 2% 0,25W	
3626	482205110102	1k 2% 0,25W	
3628	482211710837	100k 1% 0,1W	
3630	482205120471	470R 5% 0,1W	
3672	482205120472	4k7 5% 0,1W	Autoreverse
3674	482211652283	4k7 5% 0,5W	
3676	482211710834	47k 1% 0,1W	Autoreverse
3678	482211710834	47k 1% 0,1W	
3679	482211710834	47k 1% 0,1W	
3680	482211710834	47k 1% 0,1W	

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

3685	482211652234	100k 5% 0,5W	
3686	482211710837	100k 1% 0,1W	
3688	482211710361	680R 1% 0,1W	Autoreverse
3701	482211711503	220R 1% 0,1W	
3702	482211711503	220R 1% 0,1W	
3703	482211711503	220R 1% 0,1W	
3704	482211711503	220R 1% 0,1W	
3705	482211711503	220R 1% 0,1W	
3706	482211711503	220R 1% 0,1W	
3707	482205120101	100R 5% 0,1W	
3708	482205120101	100R 5% 0,1W	
3709	482205120109	10R 5% 0,1W	
3710	482205120109	10R 5% 0,1W	
3711	482205120154	150k 5% 0,1W	
3712	482205120154	150k 5% 0,1W	
3713	482205120109	10R 5% 0,1W	
3714	482205120109	10R 5% 0,1W	
3715	482205120182	1k8 5% 0,1W	
3716	482205120182	1k8 5% 0,1W	
3717	482211711449	2k2 1% 0,1W	
3718	482211711449	2k2 1% 0,1W	
3719	482211711383	12k 1% 0,1W	
3720	482211711383	12k 1% 0,1W	
3721	482205120392	3k9 5% 0,1W	
3722	482205120392	3k9 5% 0,1W	
3723	482211683933	15k 1% 0,1W	Autoreverse
3723	482211710965	18k 1% 0,1W	Non-autoreverse
3724	482211683933	15k 1% 0,1W	Autoreverse
3724	482211710965	18k 1% 0,1W	Non-autoreverse
3725	482205120109	10R 5% 0,1W	
3726	482205120109	10R 5% 0,1W	
3727	482205120562	5k6 5% 0,1W	Autoreverse
3727	482211711507	6k8 1% 0,1W	Non-autoreverse
3728	482205120562	5k6 5% 0,1W	Autoreverse
3728	482211711507	6k8 1% 0,1W	Non-autoreverse
3729	482205120332	3k3 5% 0,1W	Autoreverse
3729	482205120472	4k7 5% 0,1W	Non-autoreverse
3730	482205120332	3k3 5% 0,1W	Autoreverse
3730	482205120472	4k7 5% 0,1W	Non-autoreverse
3731	482205120822	8k2 5% 0,1W	
3732	482205120822	8k2 5% 0,1W	
3733	482205120122	1k2 5% 0,1W	
3734	482205120122	1k2 5% 0,1W	
3735	482205120223	22k 5% 0,1W	
3736	482205120223	22k 5% 0,1W	
3741	482211711449	2k2 1% 0,1W	
3742	482211711449	2k2 1% 0,1W	
3743	482211711139	1k5 1% 0,1W	Autoreverse
3743	482211711449	2k2 1% 0,1W	Non-autoreverse
3744	482211711139	1k5 1% 0,1W	Autoreverse
3744	482211711449	2k2 1% 0,1W	Non-autoreverse
3745	482205120332	3k3 5% 0,1W	Autoreverse
3745	482205120562	5k6 5% 0,1W	Non-autoreverse
3746	482205120332	3k3 5% 0,1W	Autoreverse
3746	482205120562	5k6 5% 0,1W	Non-autoreverse
3748	482211711449	2k2 1% 0,1W	
3749	482211710834	47k 1% 0,1W	
3751	482211710833	10k 1% 0,1W	
3752	482211710837	100k 1% 0,1W	
3753	482211710837	100k 1% 0,1W	
3754	482205120105	1M 5% 0,1W	Autoreverse
3754	482205120479	47R 5% 0,1W	Non-autoreverse
3755	482205120105	1M 5% 0,1W	Autoreverse
3755	482205120479	47R 5% 0,1W	Non-autoreverse
3756	482211713579	220k 1% 0,1W	
3757	482211713579	220k 1% 0,1W	
3758	482211710833	10k 1% 0,1W	
3759	482211710833	10k 1% 0,1W	
3760	482205120121	120R 5% 0,1W	
3761	482205021003	10k 1% 0,6W	
3762	482211711454	820R 1% 0,1W	
3763	482205120154	150k 5% 0,1W	
3764	482211683872	220R 5% 0,5W	
3765	482205120393	39k 5% 0,1W	
3766	482205120475	4M7 5% 0,1W	
3767	482205120475	4M7 5% 0,1W	
3768	482211710833	10k 1% 0,1W	
3769	482211711383	12k 1% 0,1W	Autoreverse
3769	482205120822	8k2 5% 0,1W	Non-autoreverse
3770	482211711139	1k5 1% 0,1W	
3771	482205120122	1k2 5% 0,1W	
3772	482211711507	6k8 1% 0,1W	Autoreverse
3772	482205120562	5k6 5% 0,1W	Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W	
3774	482211683933	15k 1% 0,1W	Autoreverse
3774	482205120822	8k2 5% 0,1W	Non-autoreverse
3775	482205120478	4R7 5% 0,1W	
3776	482211711507	6k8 1% 0,1W	
3777	482211710353	150R 1% 0,1W	
3778	482205210688	⚠ 6R8 5% 0,33W	
3779	482205120334	330k 5% 0,1W	
3780	482205120105	1M 5% 0,1W	
3781	482205120475	4M7 5% 0,1W	
3784	482205110102	1k 2% 0,25W	
3786	482205120223	22k 5% 0,1W	
3787	482205120105	1M 5% 0,1W	
3788	482205120105	1M 5% 0,1W	
3789	482211710834	47k 1% 0,1W	
4701	482205120008	0R Jumper 0805	
4702	482205120008	0R Jumper 0805	
4703	482205120008	0R Jumper 0805	
4704	482205120008	0R Jumper 0805	
4705	482205120008	0R Jumper 0805	
4706	482205120008	0R Jumper 0805	

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

RESISTORS

4707	482205120008	0R Jumper 0805
4708	482205120008	0R Jumper 0805
4709	482205120008	0R Jumper 0805
4710	482205120008	0R Jumper 0805
4711	482205120008	0R Jumper 0805
4712	482205120008	0R Jumper 0805
4713	482205120008	0R Jumper 0805
4714	482205120008	0R Jumper 0805
4715	482205120008	0R Jumper 0805
4716	482205120008	0R Jumper 0805
4717	482205120008	0R Jumper 0805
4718	482205120008	0R Jumper 0805
4719	482205120008	0R Jumper 0805
4720	482205120008	0R Jumper 0805
4721	482205120008	0R Jumper 0805
4722	482205120008	0R Jumper 0805
4723	482205120008	0R Jumper 0805
4724	482205120008	0R Jumper 0805
4725	482205120008	0R Jumper 0805
4726	482205120008	0R Jumper 0805
4727	482205120008	0R Jumper 0805
4728	482205120008	0R Jumper 0805
4729	482205120008	0R Jumper 0805
4730	482205120008	0R Jumper 0805
4731	482205120008	0R Jumper 0805
4732	482205120008	0R Jumper 0805
4733	482205120008	0R Jumper 0805
4734	482205120008	0R Jumper 0805
4735	482205120008	0R Jumper 0805
4736	482205120008	0R Jumper 0805
4737	482205120008	0R Jumper 0805
4738	482205120008	0R Jumper 0805
4739	482205120008	0R Jumper 0805
4740	482205120008	0R Jumper 0805
4741	482205120008	0R Jumper 0805
4742	482205120008	0R Jumper 0805
4744	482205120008	0R Jumper 0805
4745	482205120008	0R Jumper 0805
4746	482205120008	0R Jumper 0805
4748	482205120008	0R Jumper 0805
4785	482205120008	0R Jumper 0805
4790	482205120008	0R Jumper 0805
4794	482205120008	0R Jumper 0805
4795	482205120008	0R Jumper 0805

COILS & FILTERS

5701	482215711477	Coil 2,2µH 5%
5703	482215620946	Osc Coil 100kHz

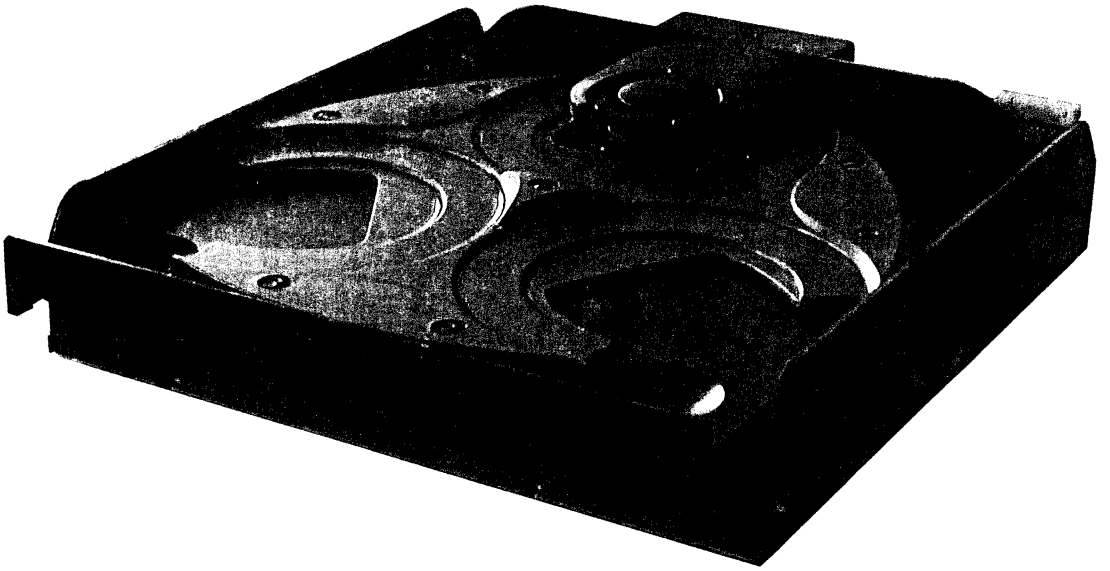
DIODES

6611	482213031878	1N4003G	
6612	482213031878	1N4003G	
6614	482213030621	1N4148	Autoreverse
6770	482213030621	1N4148	
6771	482213030621	1N4148	
6772	482213030621	1N4148	
6773	482213030621	1N4148	
6774	482213030621	1N4148	
6775	482213030621	1N4148	
6776	482213030621	1N4148	
6777	482213034382	BZX79-F8V2	
6778	482213030621	1N4148	
6782	482213030621	1N4148	
6785	482213030621	1N4148	
6786	482213030621	1N4148	

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT	
7612	532213060845	BC807-25	
7613	532213060845	BC807-25	
7614	532213060845	BC807-25	
7616	482213060373	BC857B	Autoreverse
7618	482213060511	BC847B	
7619	482213060511	BC847B	
7620	482213060511	BC847B	
7622	482213060511	BC847B	Autoreverse
7623	482213060511	BC847B	
7624	482213060511	BC847B	
7710	482220932919	HEF4952BT	
7720	932214000668	AN7323S	
7730	482220932919	HEF4952BT	
7740	482220932919	HEF4952BT	
7780	482213060511	BC847B	
7781	482213042804	BC817-25	
7782	482213044568	BC557B	
7783	482213060511	BC847B	
7784	482213060373	BC857B	
7786	482213063494	J111	
7787	482213060511	BC847B	
7791	482213060511	BC847B	
7792	482213060511	BC847B	

Note: Only the parts mentioned in this list are normal service spare parts.



3 - Video CD Module

(3 Disc Carrousel Changer)

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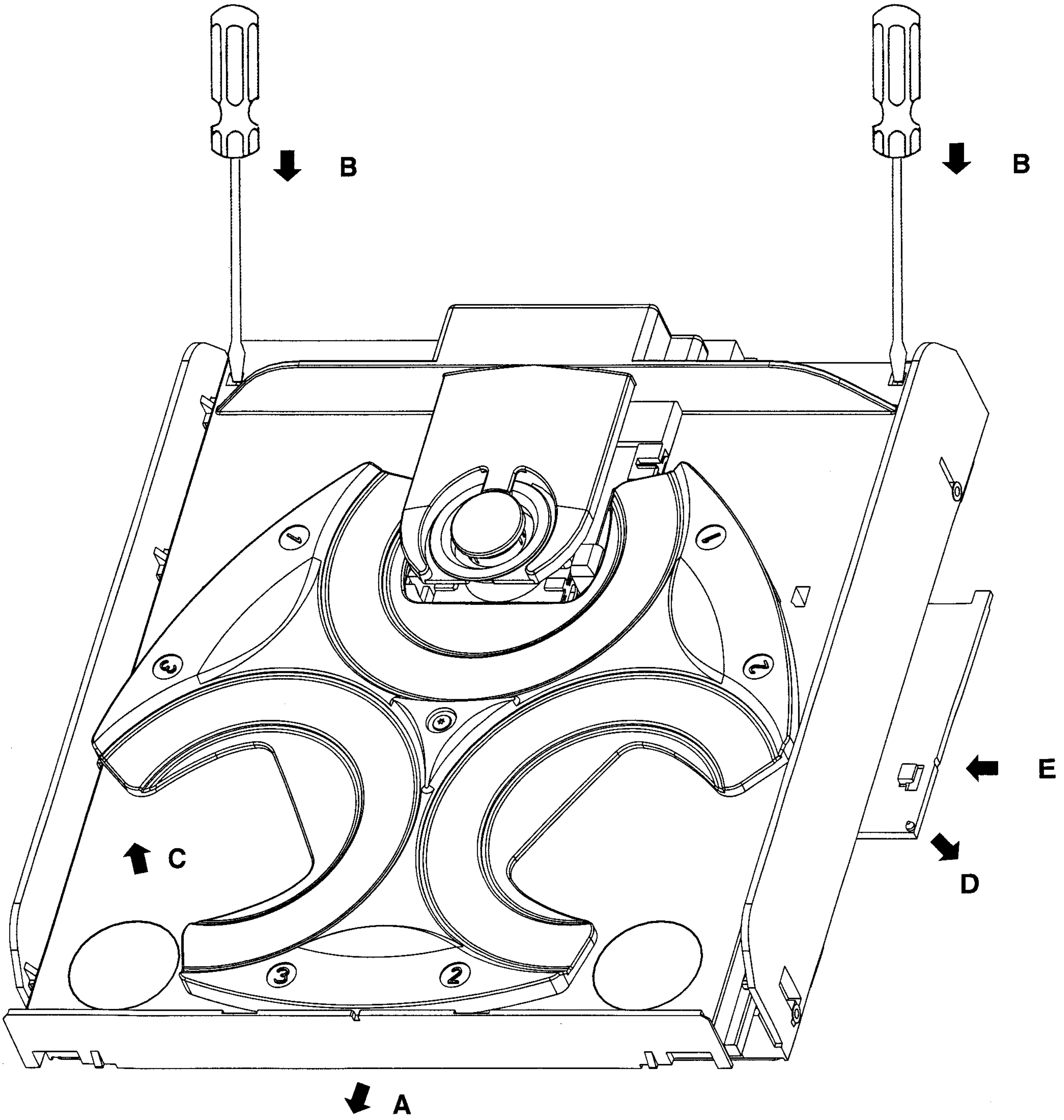
Electrical Parts List 10-12

Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

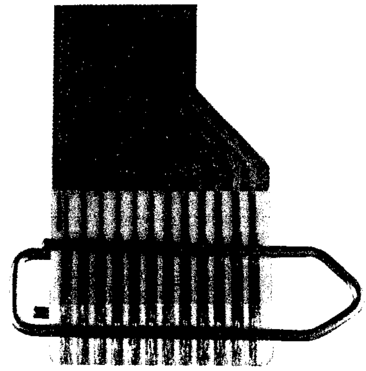
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

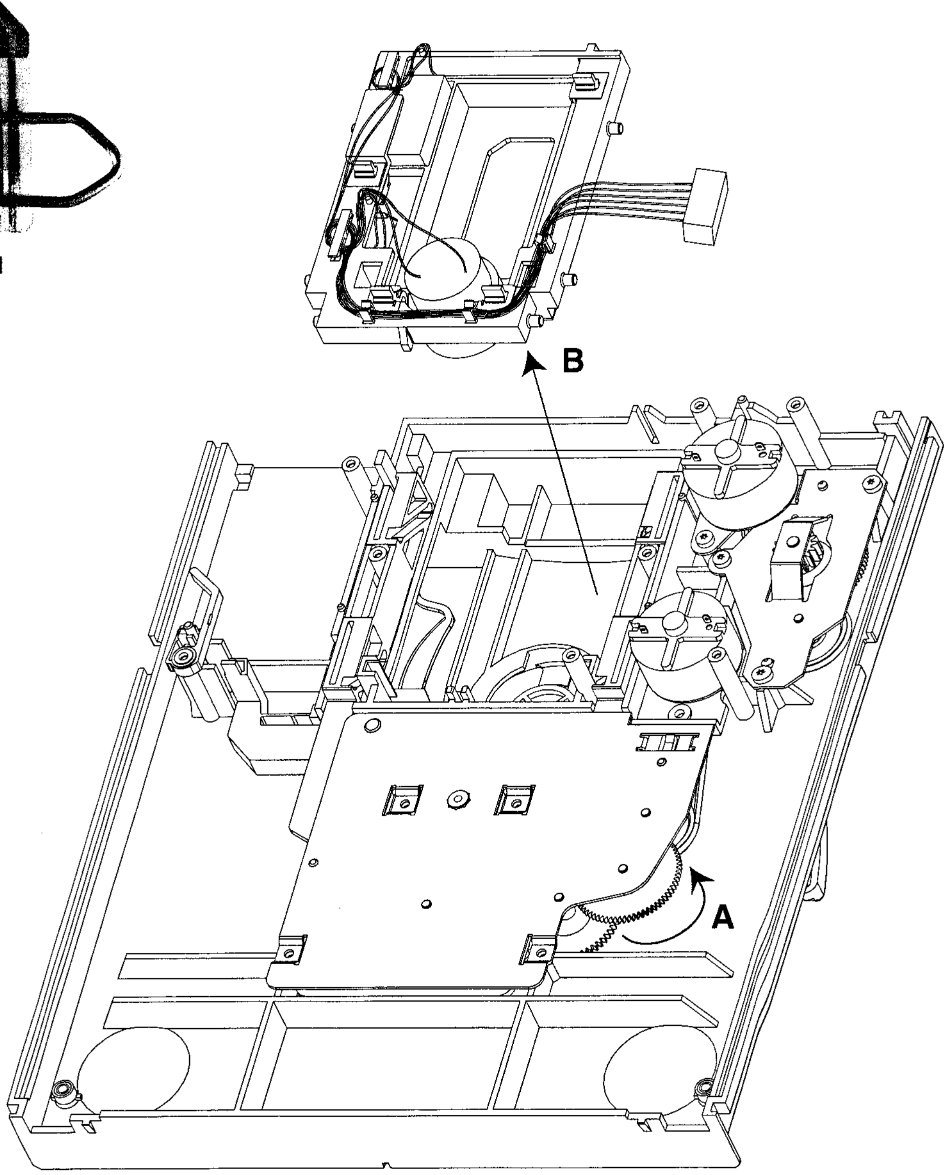
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
6. Demount CD drive support (pos 95) Ⓑ.
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

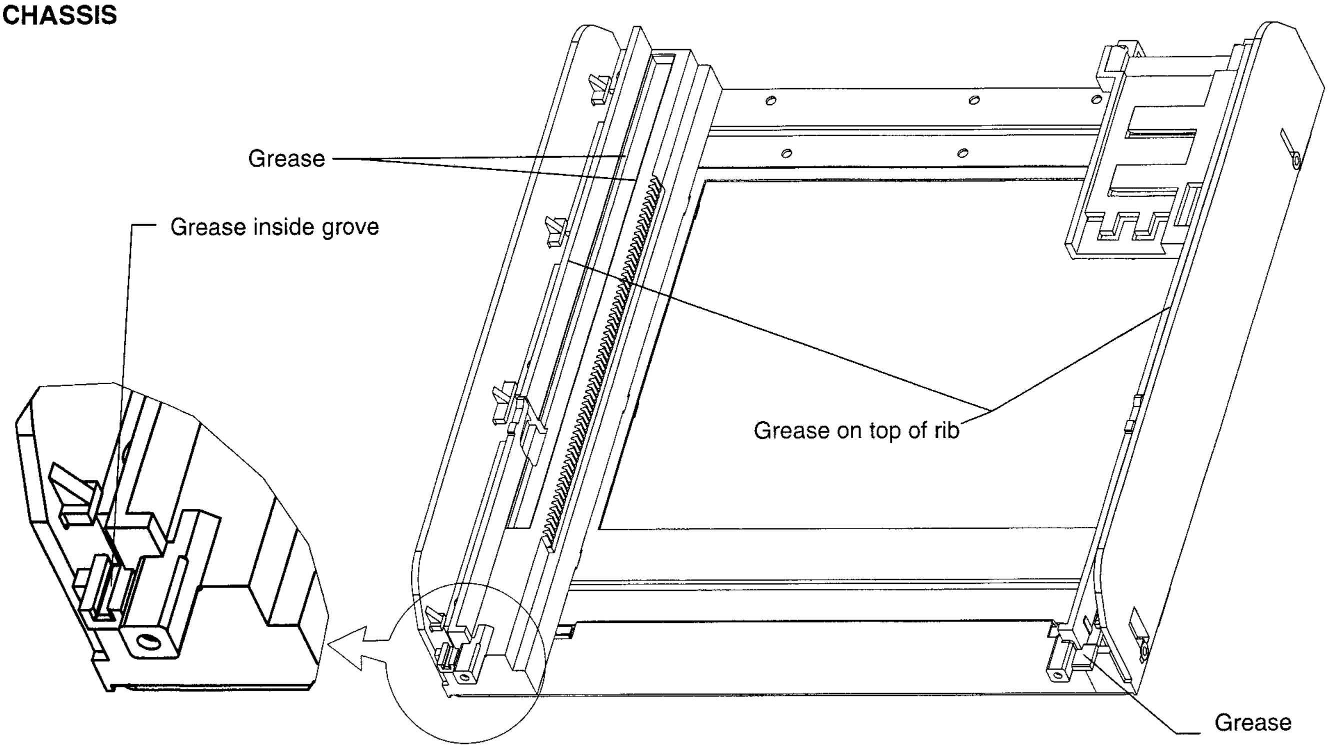


Mounting of Carrousel

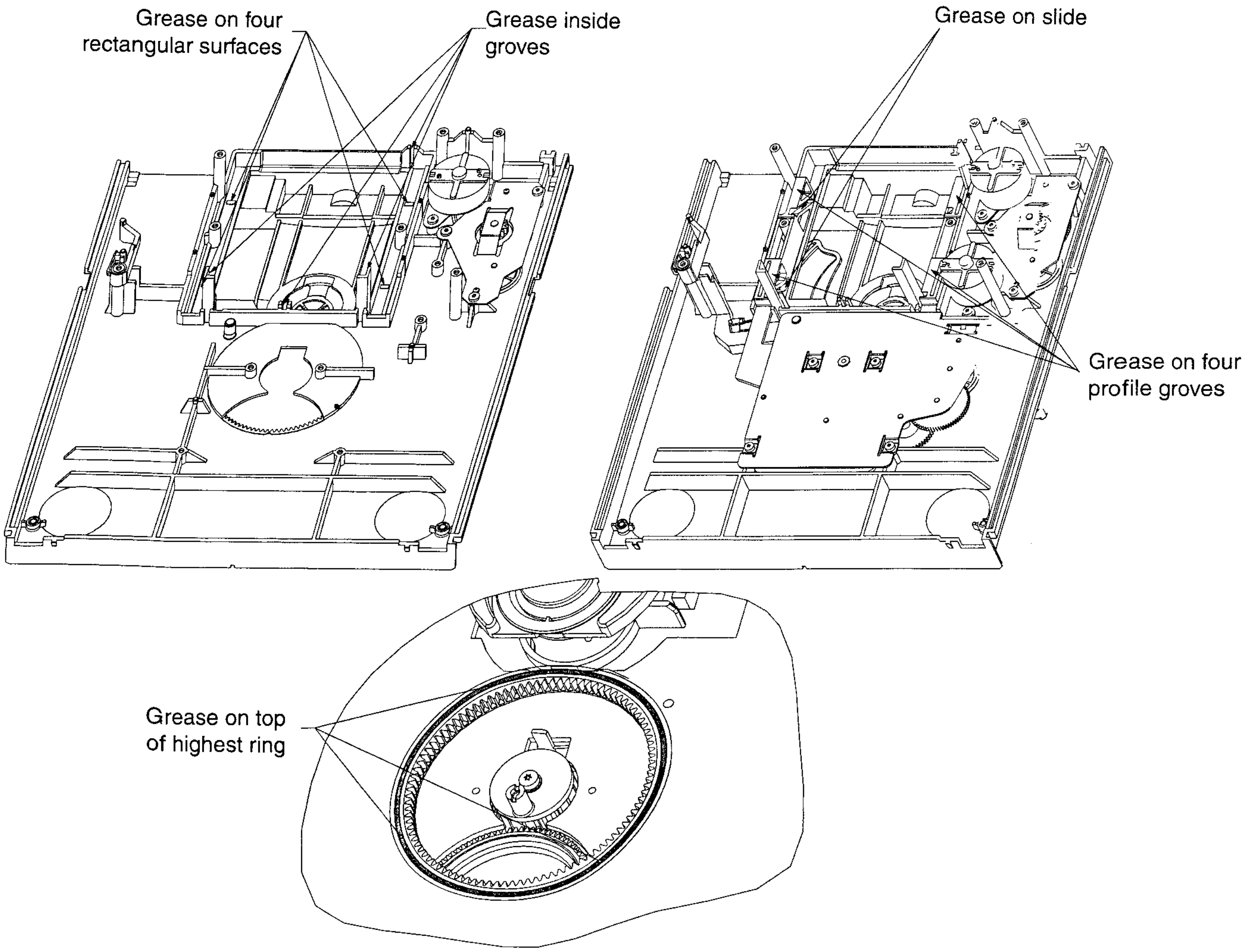
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn't matter.

Lubrication Instructions

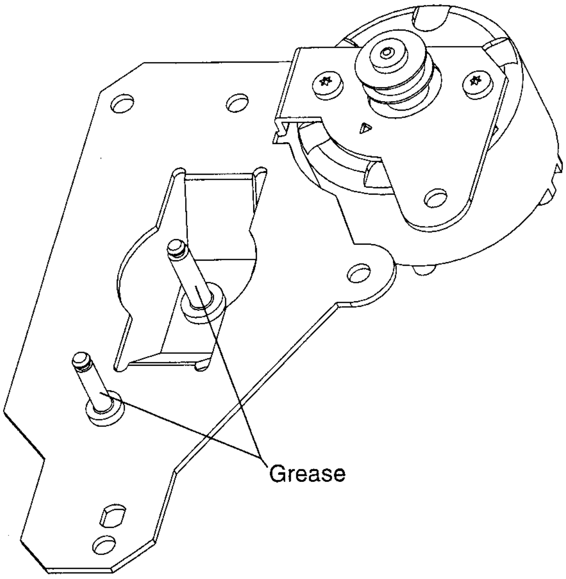
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

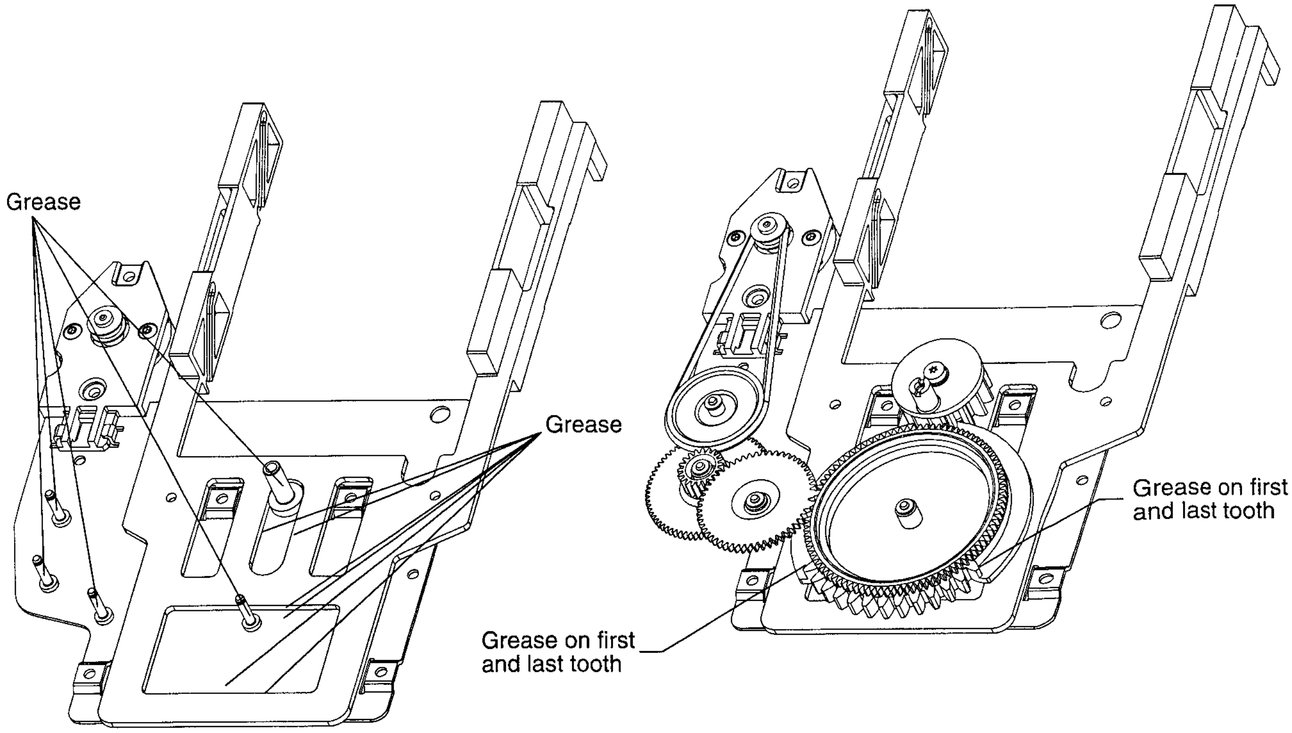
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:
1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

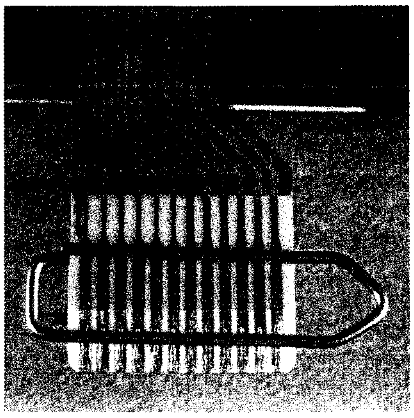


fig.1

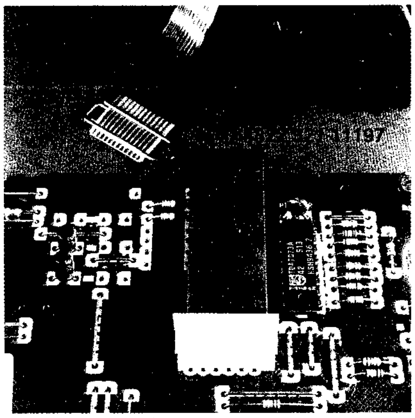


fig.2

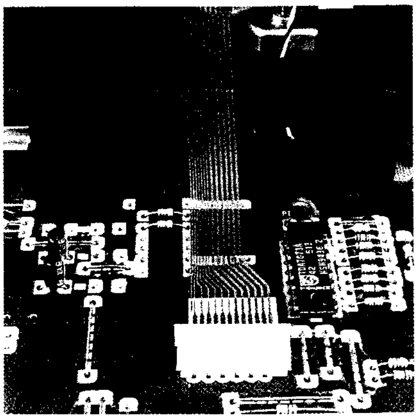
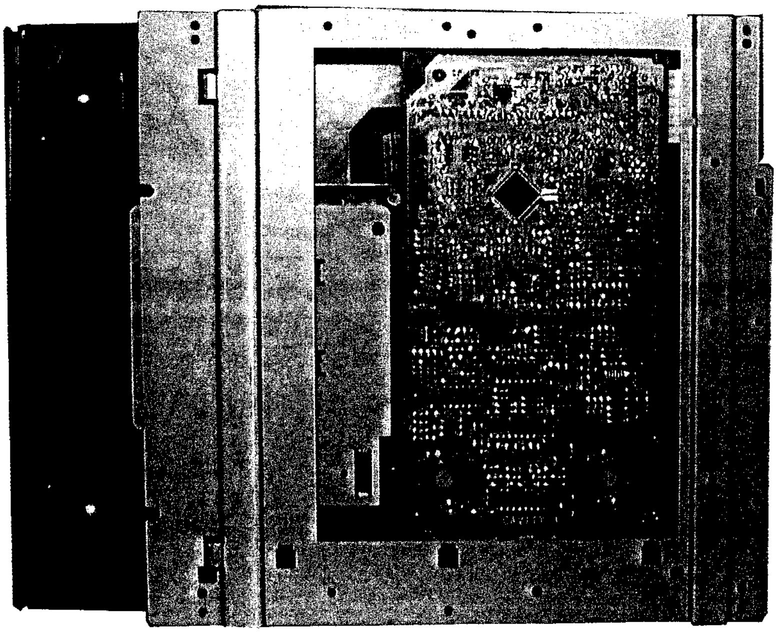
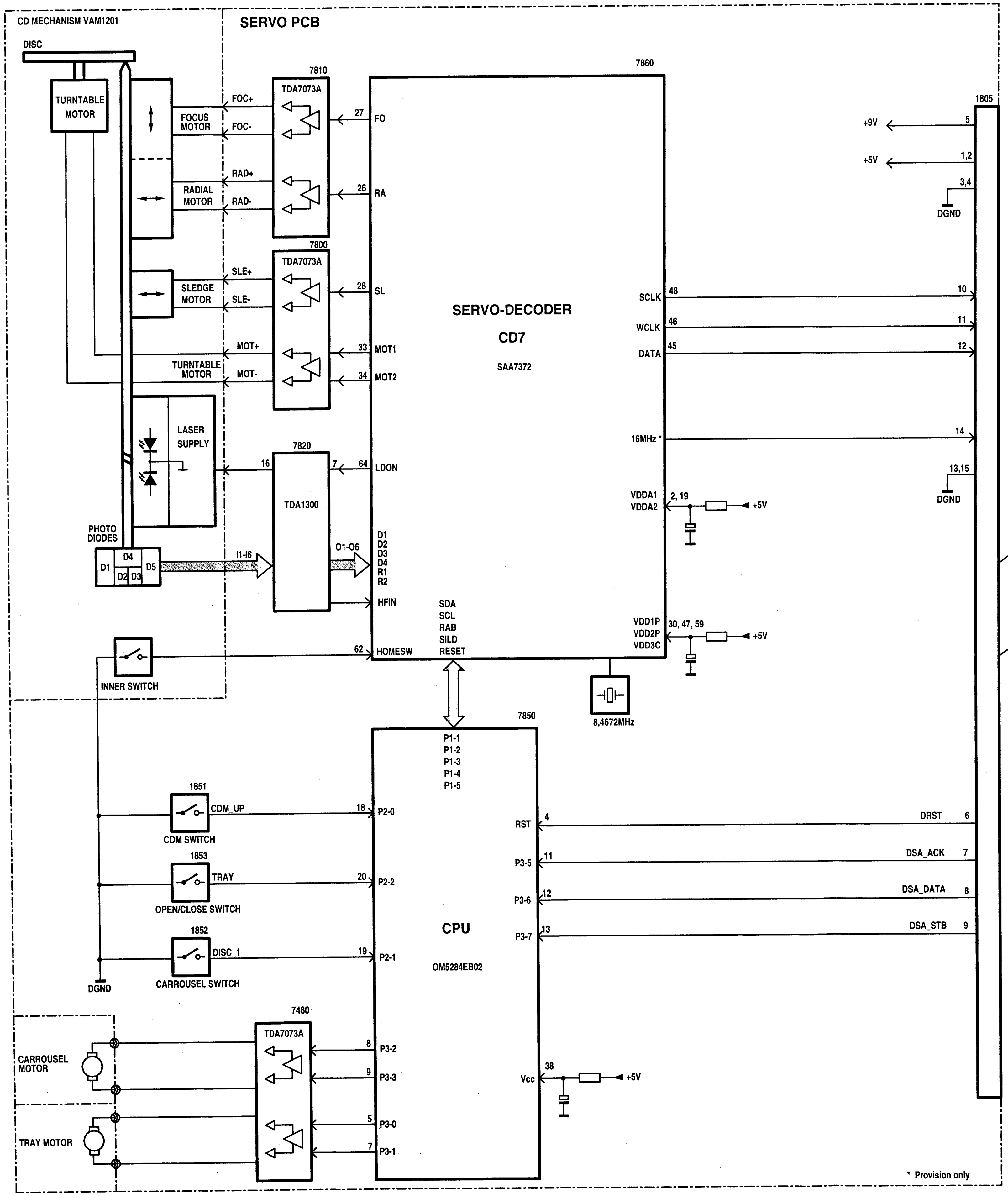


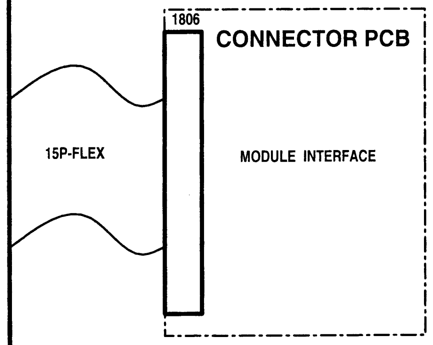
fig.3

Service Position

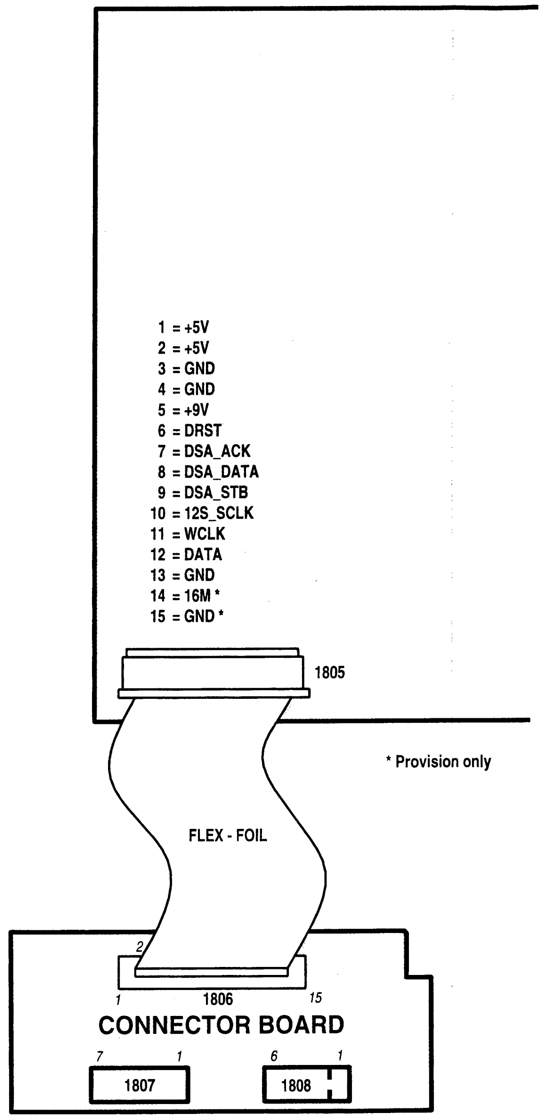


BLOCK DIAGRAM


CD MECHANISM VAM1201
SERVO PCB
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER SUPPLY
PHOTO DIODES
D1
D2
D3
D4
D5
FOC+
FOC-
RAD+
RAD-
SLE+
SLE-
MOT+
MOT-
7810
TDA7073A
7800
TDA7073A
7820
TDA1300
16
7
I1-I6
O1-O6
7860
SERVO-DECODER
CD7
SAA7372
27 FO
26 RA
28 SL
33 MOT1
34 MOT2
64 LDON
D1
D2
D3
D4
R1
R2
HFIN
62 HOMESW
SDA
SCL
RAB
SILD
RESET
SCLK 48
WCLK 46
DATA 45
16MHz *
VDDA1
VDDA2
2, 19
+5V
VDD1P
VDD2P
VDD3C
30, 47, 59
+5V
8,4672MHz
1805
+9V 5
+5V 1,2
3,4
DGND
10
11
12
14
13,15
DGND
INNER SWITCH
7850
P1-1
P1-2
P1-3
P1-4
P1-5
1851
CDM_UP
CDM SWITCH
18 P2-0
1853
TRAY
OPEN/CLOSE SWITCH
20 P2-2
1852
DISC_1
CARROUSEL SWITCH
19 P2-1
DGND
CPU
OM5284EB02
RST 4
DRST 6
P3-5 11
DSA_ACK 7
P3-6 12
DSA_DATA 8
P3-7 13
DSA_STB 9
7480
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR
8 P3-2
9 P3-3
5 P3-0
7 P3-1
Vcc 38
+5V
* Provision only


1806
CONNECTOR PCB
15P-FLEX
MODULE INTERFACE

WIRING DIAGRAM

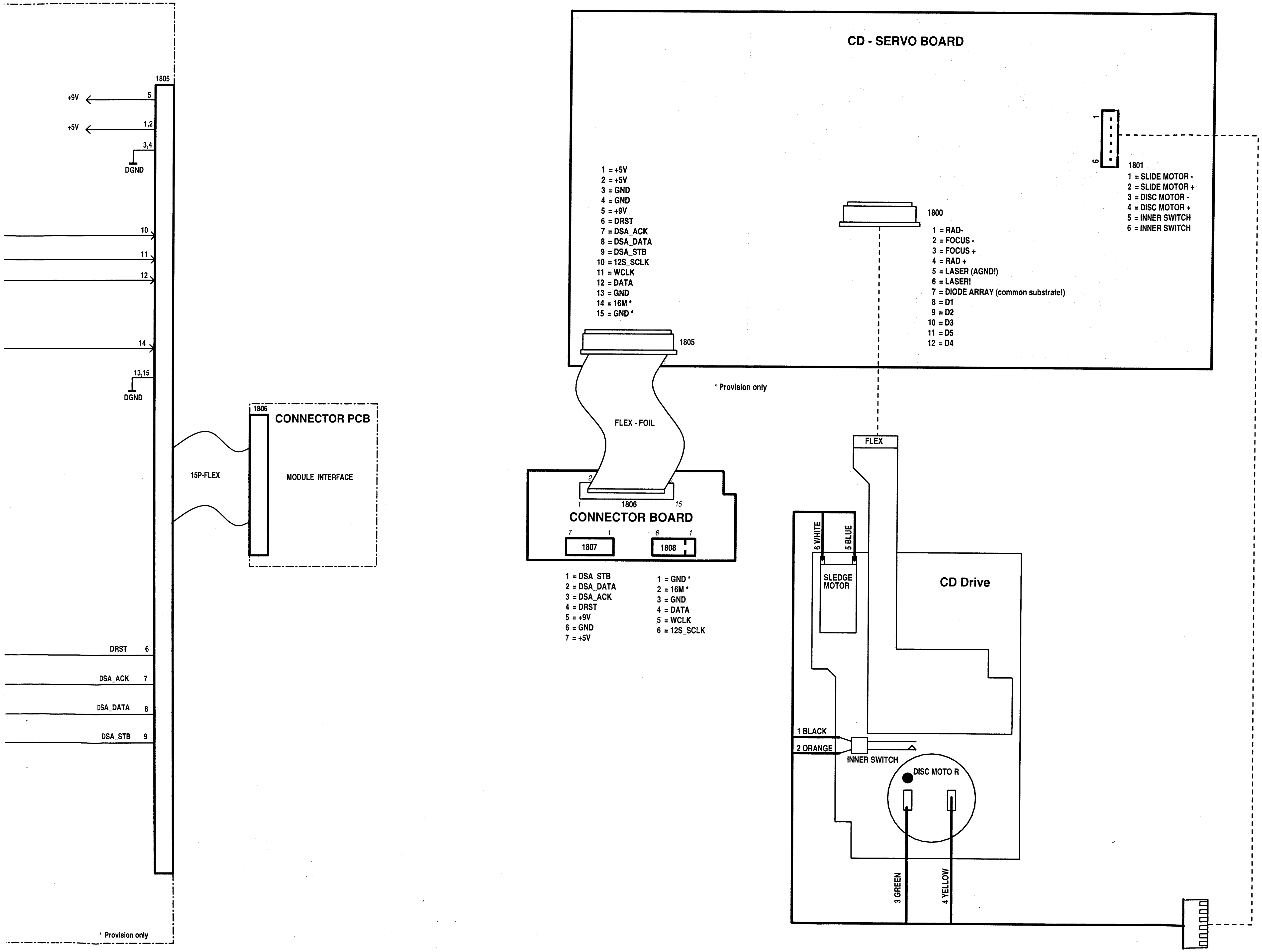

1805
* Provision only
FLEX - FOIL
2
1
1806
15
CONNECTOR BOARD
7
1
6
1
1807
1808

1 = +5V
2 = +5V
3 = GND
4 = GND
5 = +9V
6 = DRST
7 = DSA_ACK
8 = DSA_DATA
9 = DSA_STB
10 = 12S_SCLK
11 = WCLK
12 = DATA
13 = GND
14 = 16M *
15 = GND *

1 = DSA_STB
2 = DSA_DATA
3 = DSA_ACK
4 = DRST
5 = +9V
6 = GND
7 = +5V

1 = GND *
2 = 16M *
3 = GND
4 = DATA
5 = WCLK
6 = 12S_SCLK

WIRING DIAGRAM


1805
+9V
5
+5V
1,2
3,4
DGND
10
11
12
14
13,15
DGND
15P-FLEX
1806
CONNECTOR PCB
MODULE INTERFACE
DRST 6
DSA_ACK 7
DSA_DATA 8
DSA_STB 9
* Provision only
CD - SERVO BOARD
1 = +5V
2 = +5V
3 = GND
4 = GND
5 = +9V
6 = DRST
7 = DSA_ACK
8 = DSA_DATA
9 = DSA_STB
10 = 12S_SCLK
11 = WCLK
12 = DATA
13 = GND
14 = 16M *
15 = GND *
1805
1800
1 = RAD-
2 = FOCUS -
3 = FOCUS +
4 = RAD +
5 = LASER (AGND!)
6 = LASER!
7 = DIODE ARRAY (common substrate!)
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
1
6
1801
1 = SLIDE MOTOR -
2 = SLIDE MOTOR +
3 = DISC MOTOR -
4 = DISC MOTOR +
5 = INNER SWITCH
6 = INNER SWITCH
* Provision only
FLEX - FOIL
2
1
1806
15
CONNECTOR BOARD
7
1
6
1
1807
1808
1 = DSA_STB
2 = DSA_DATA
3 = DSA_ACK
4 = DRST
5 = +9V
6 = GND
7 = +5V
1 = GND *
2 = 16M *
3 = GND
4 = DATA
5 = WCLK
6 = 12S_SCLK
FLEX
6 WHITE
5 BLUE
SLEDGE MOTOR
CD Drive
1 BLACK
2 ORANGE
INNER SWITCH
DISC MOTO R
3 GREEN
4 YELLOW

SERVO CIRCUIT

1450	D28	1800	J 2	1800	H 2	1801	C 2	1805	C24	1805	K24
1800	D 2	1800	K 2	1801	A 2	1802	E28	1805	C24	1805	E24
1800	G 2	1800	H 2	1801	A 2	1803	E26	1805	C24	1805	E24
1800	F 2	1800	I 2	1801	B 2	1804	F26	1805	K24	1805	E24
1800	D 2	1800	H 2	1801	B 2	1805	B24	1805	K24	1805	I24
1800	J 2	1800	G 2	1801	C 2	1805	B24	1805	K24	1805	I24

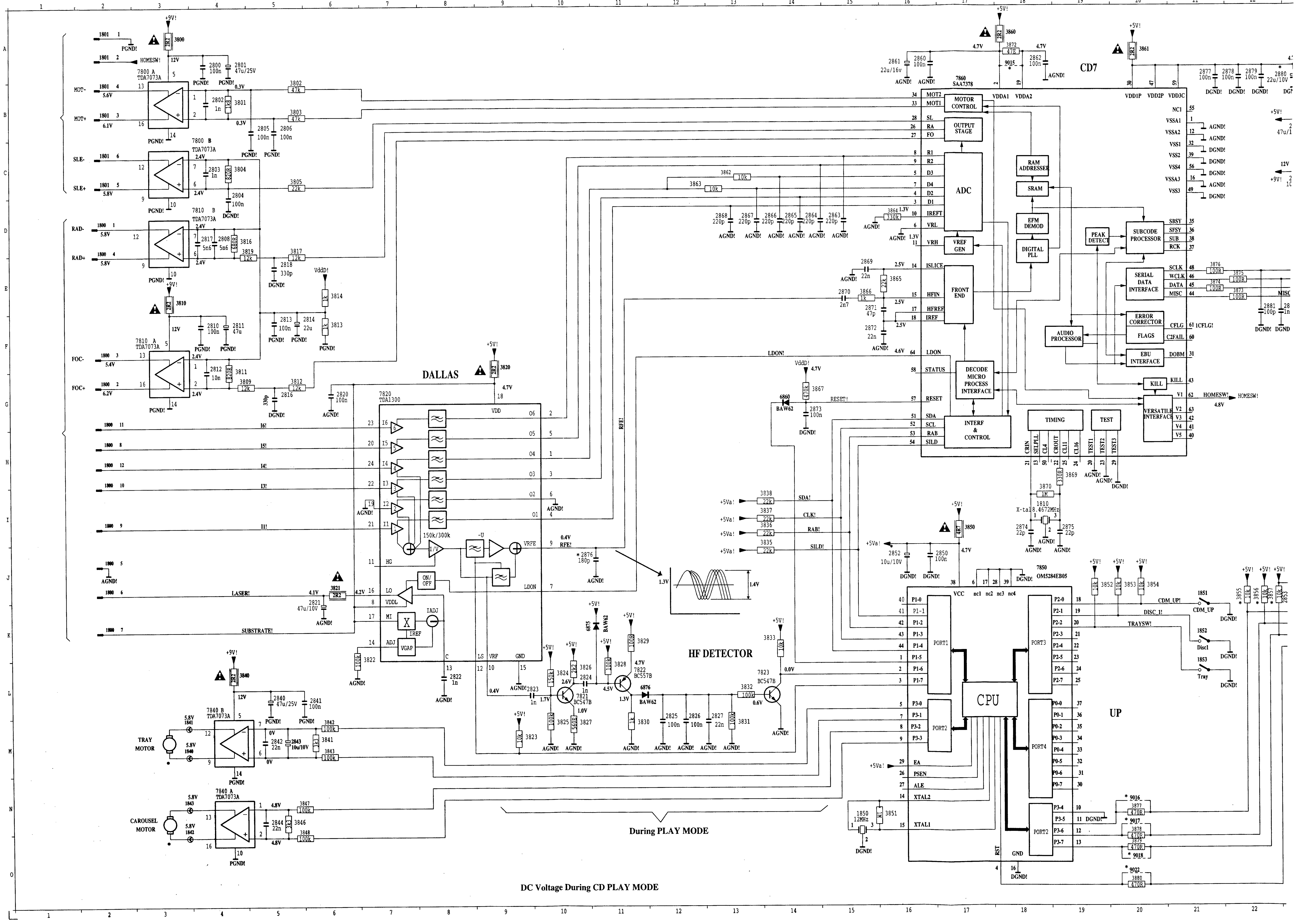
1805	I24	1811	G28	21	G27	2805	B 5	2813	F 5	2821	K 6
1806	A27	1850	N15	2800	A 4	2806	B 5	2814	F 6	2822	L 8
1807	A27	1851	J21	2801	A 5	2808	D 4	2816	G 5	2823	L 9
1808	D27	1852	K21	2802	B 4	2810	F 4	2817	D 4	2824	L10
1809	F27	1853	L21	2803	C 4	2811	F 4	2818	E 5	2825	M12
1810	I18	20	E27	2804	C 4	2812	F 4	2820	G 6	2826	M12

2827	M13	2843	M 5	2860	A16	2866	D14	2872	F15	2878	A21
2828	G27	2844	N 5	2861	A16	2867	D13	2873	G15	2879	A22
2829	G27	2850	J16	2862	A18	2868	D13	2874	I18	2880	A22
2840	L 5	2851	J23	2863	D15	2869	E15	2875	I19	2881	E22
2841	L 6	2852	J16	2864	D14	2870	E15	2876	J11	2882	E23
2842	M 5	2853	K23	2865	D14	2871	E15	2877	A21	2883	E23

2884	E23	2892	B23	3804	C 4	3811	G 4	3819	D 5	3825	M10
2885	E27	2893	C23	3805	C 5	3812	G 5	3820	F 9	3826	L11
2886	H26	3800	A 3	3806	F27	3813	F 6	3821	J 6	3827	M11
2887	D28	3801	B 4	3807	H27	3814	E 6	3822	L 7	3828	L11
2890	B23	3802	B 5	3809	G 4	3816	D 5	3823	M10	3829	K12
2891	C23	3803	B 5	3810	E 3	3817	D 5	3824	L10	3830	M12

3831	M13	3838	I14	3847	N 5	3854	J20	3860	A18	3866	E15
3832	L13	3840	L 4	3848	N 5	3855	J22	3861	A20	3867	G14
3833	K14	3841	M 6	3850	I17	3856	J22	3862	C13	3869	H19
3835	J14	3842	M 6	3851	N16	3857	J22	3863	C12	3870	I18
3836	I14	3843	M 6	3852	J20	3858	L23	3864	D16	3872	A18
3837	I14	3846	N 5	3853	J20	3859	K24	3865	E16	3873	E22

3874	E21	3880	O20	7800	C 4	7823	L13
3875	E22	6850	L23	7810	F 3	7840	N 4
3876	E21	6860	G14	7810	D 4	7840	L 4
3877	N20	6875	K10	7820	G 7	7850	J18
3878	N20	6876	L11	7821	L10	7860	B17
3879	O20	7800	A 3	7822	L11	9001	L26

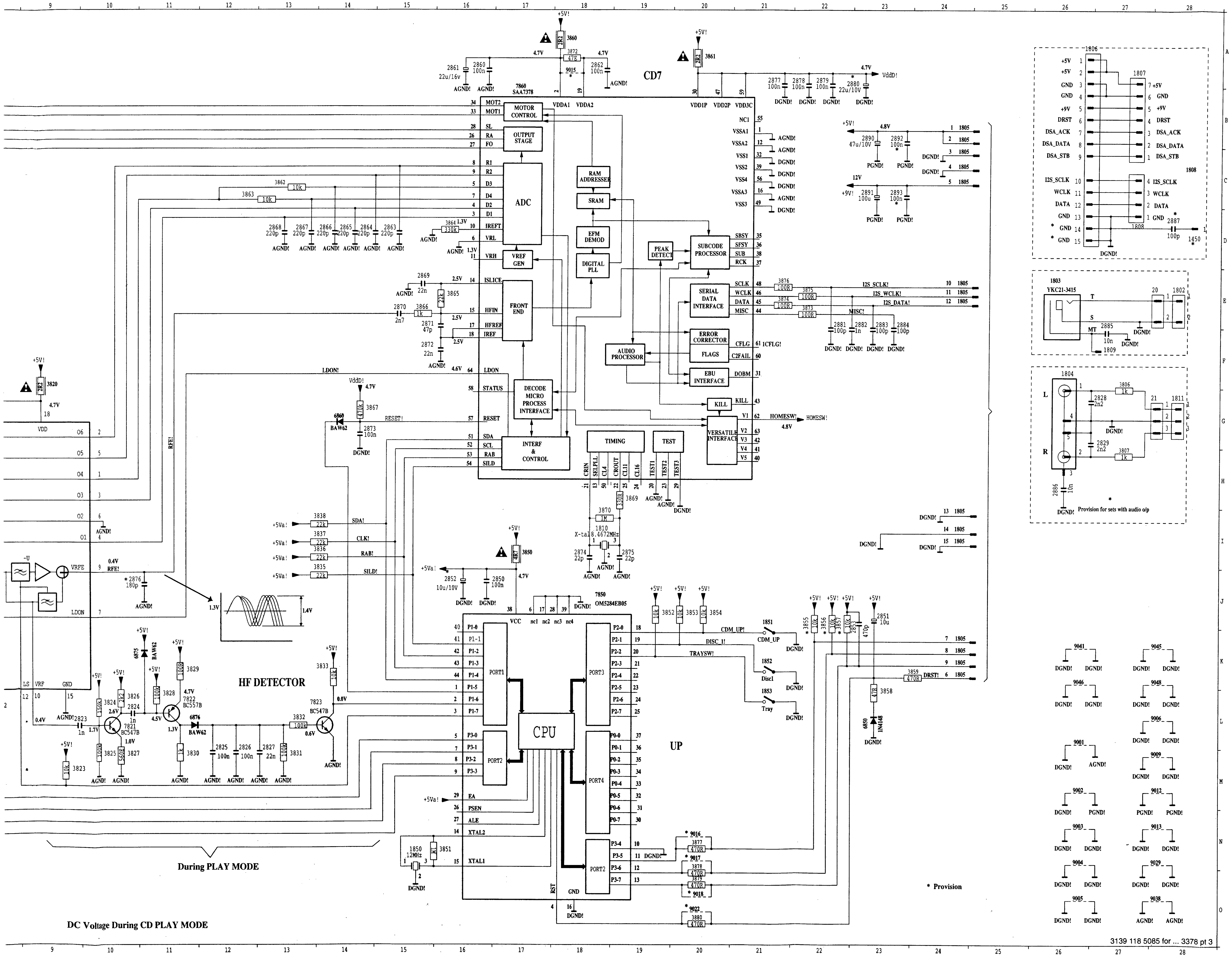


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
MOT-
MOT+
SLE-
SLE+
RAD-
RAD+
FOC-
FOC+
HOMESW!
PGND!
7800 A TDA7073A
7800 B TDA7073A
7810 B TDA7073A
7810 A TDA7073A
+9V!
12V
3800
3810
2R2
DALLAS
7820 TDA1300
VDD
HG
LO
VDDL
MI
ADJ
VGAP
IADJ
IREF
ON/OFF
VRFE
LDON
LS
VRP
GND
150k/300k
I/V
LASER!
SUBSTRATE!
RFE!
0.4V
1.3V
1.4V
TRAY MOTOR
CAROUSEL MOTOR
7840 B TDA7073A
7840 A TDA7073A
3840
HF DETECTOR
7821 BC547B
7822 BC557B
7823 BC547B
6875 BAW62
6876 BAW62
CD7
7860 SAA7378
MOTOR CONTROL
OUTPUT STAGE
ADC
VREF GEN
FRONT END
DECODE MICRO PROCESS INTERFACE
INTERF & CONTROL
RAM ADDRESSER
SRAM
EFM DEMOD
DIGITAL PLL
PEAK DETECT
SUBCODE PROCESSOR
SERIAL DATA INTERFACE
ERROR CORRECTOR
FLAGS
EBU INTERFACE
AUDIO PROCESSOR
KILL
VERSATILE INTERFACE
TIMING
TEST
MOT2
MOT1
SL
RA
FO
R1
R2
D3
D4
D2
D1
IREFT
VRL
VRH
ISLICE
HFIN
HFREF
IREF
LDON
STATUS
RESET
SDA
SCL
RAB
SILD
VDDA1
VDDA2
VDD1P
VDD2P
VDD3C
SBSY
SFSY
SUB
RCK
SCLK
WCLK
DATA
MISC
CFLG
C2FAIL
DOBM
HOMESW!
1810 X-tal 8.4672MHz
6860 BAW62
RESET!
SDA!
CLK!
RAB!
SILD!
LDON!
AGND!
DGND!
+5V!
+5Va!
VddD!
7850 OM5284EB05
CPU
PORT1
PORT2
PORT3
PORT4
UP
VCC
EA
PSEN
ALE
XTAL2
XTAL1
RST
1850 12MHz
1851 CDM_UP
1852 Discl
1853 Tray
CDM_UP!
DISC I!
TRAYSW!

During PLAY MODE

DC Voltage During CD PLAY MODE

2827	M13
2828	G27
2829	G27
2840	L 5
2841	L 6
2842	M 5
2843	M 5
2844	N 5
2850	J16
2851	J23
2852	J16
2853	K23
2860	A16
2861	A16
2862	A18
2863	D15
2864	D14
2865	D14
2866	D14
2867	D13
2868	D13
2869	E15
2870	E15
2871	E15
2872	F15
2873	G15
2874	I18
2875	I19
2876	J11
2877	A21
2878	A21
2879	A22
2880	A22
2881	E22
2882	E23
2883	E23
2884	E23
2885	E27
2886	H26
2887	D28
2890	B23
2891	C23
2892	B23
2893	C23
3800	A 3
3801	B 4
3802	B 5
3803	B 5
3804	C 4
3805	C 5
3806	F27
3807	H27
3809	G 4
3810	E 3
3811	G 4
3812	G 5
3813	F 6
3814	E 6
3816	D 5
3817	D 5
3819	D 5
3820	F 9
3821	J 6
3822	L 7
3823	M10
3824	L10
3825	M10
3826	L11
3827	M11
3828	L11
3829	K12
3830	M12
3831	M13
3832	L13
3833	K14
3835	J14
3836	I14
3837	I14
3838	I14
3840	L 4
3841	M 6
3842	M 6
3843	M 6
3846	N 5
3847	N 5
3848	N 5
3850	I17
3851	N16
3852	J20
3853	J20
3854	J20
3855	J22
3856	J22
3857	J22
3858	L23
3859	K24
3860	A18
3861	A20
3862	C13
3863	C12
3864	D16
3865	E16
3866	E15
3867	G14
3869	H19
3870	I18
3872	A18
3873	E22
3874	E21
3875	E22
3876	E21
3877	N20
3878	N20
3879	O20
3880	O20
6850	L23
6860	G14
6875	K10
6876	L11
7800	A 3
7800	C 4
7810	F 3
7810	D 4
7820	G 7
7821	L10
7822	L11
7823	L13
7840	N 4
7840	L 4
7850	J18
7860	B17
9001	L26
9002	M26
9003	N26
9004	N26
9005	O26
9006	L28
9009	M28
9012	M28
9013	N28
9015	A18
9016	N20
9017	N20
9018	O20
9022	O20
9029	N28
9038	O28
9041	K26
9045	K28
9046	K26
9048	K28


CD7
7860 SAA7378
MOTOR CONTROL
OUTPUT STAGE
ADC
VREF GEN
FRONT END
RAM ADDRESSER
SRAM
EFM DEMOD
DIGITAL PLL
PEAK DETECT
SUBCODE PROCESSOR
SERIAL DATA INTERFACE
ERROR CORRECTOR
FLAGS
AUDIO PROCESSOR
EBU INTERFACE
KILL
VERSATILE INTERFACE
DECODE MICRO PROCESS INTERFACE
INTERF & CONTROL
TIMING
TEST
VDDA1 VDDA2 VDD1P VDD2P VDD3C
HF DETECTOR
7821 BC547B
7822 BC557B
7823 BC547B
6875 BAW62
6876 BAW62
6860 BAW62
6850 1N4148
1810 X-tal 8.4672MHz
1850 12MHz
7850 OM5284EB05
CPU
PORT1
PORT2
PORT3
PORT4
UP
1851 CDM_UP
1852 Disc1
1853 Tray
1806
1807
1808
1805
1803 YKC21-3415
1802
1804
1811
1450
1809
L
R
Provision for sets with audio o/p
I2S_SCLK!
I2S_WCLK!
I2S_DATA!
MISC!
HOMESW!
LDON!
RESET!
SDA!
CLK!
RAB!
SILD!
CDM_UP!
DISC_1!
TRAYSW!
DRST!
VddD!
+5V!
+5Va!
+9V!
12V
AGND!
DGND!
PGND!
9001
9002
9003
9004
9005
9006
9012
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9022
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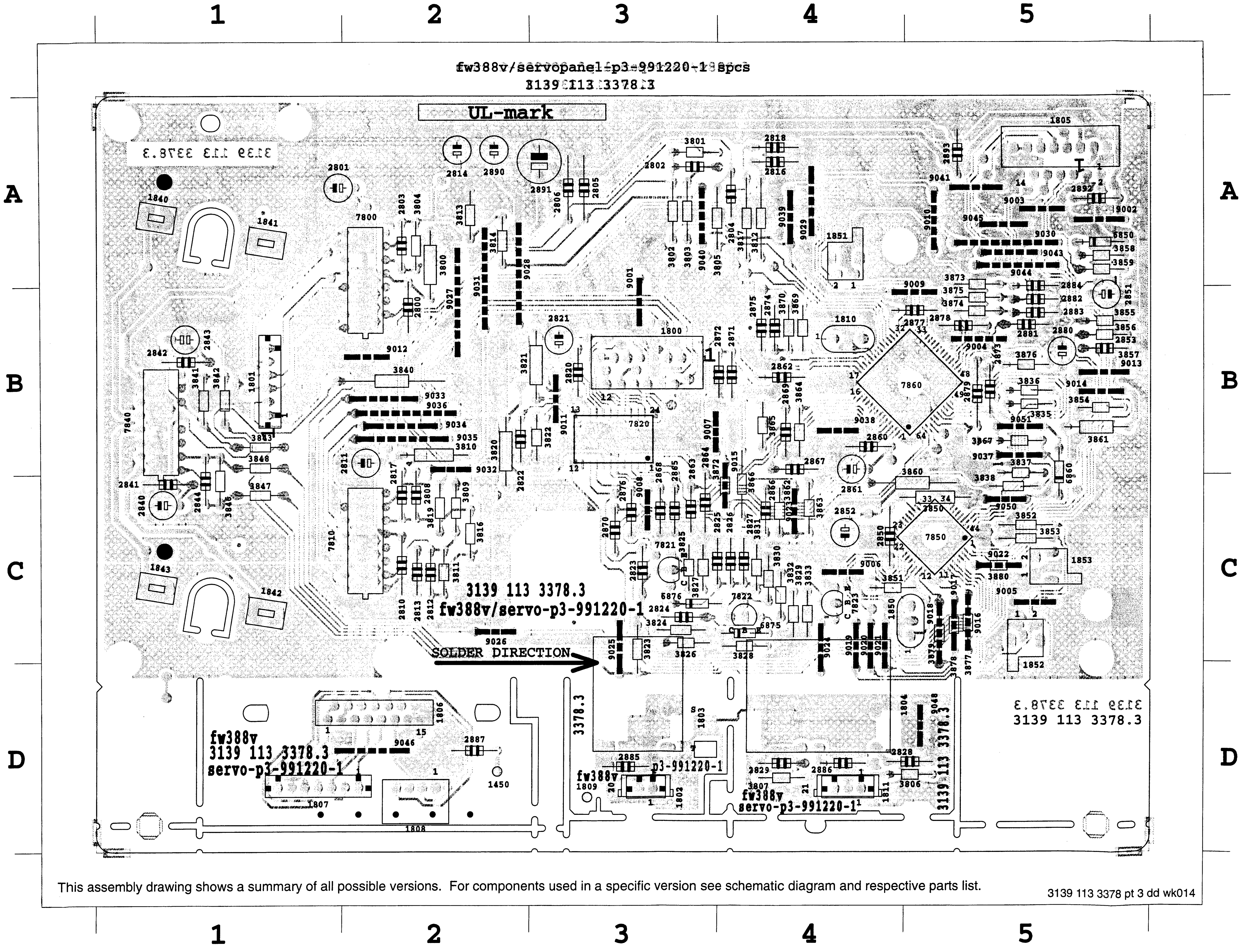
9046
9048

During PLAY MODE

DC Voltage During CD PLAY MODE

* Provision

SERVO COMPONENT LAYOUT


1
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A
B
C
D
fw388v/servopanel-p3-991220-1 8pcs
3139 113 3378.3
UL-mark
3139 113 3378.3
fw388v/servo-p3-991220-1
SOLDER DIRECTION
fw388v
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p3-991220-1
fw388v
servo-p3-991220-1
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3378.3
7800
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1800
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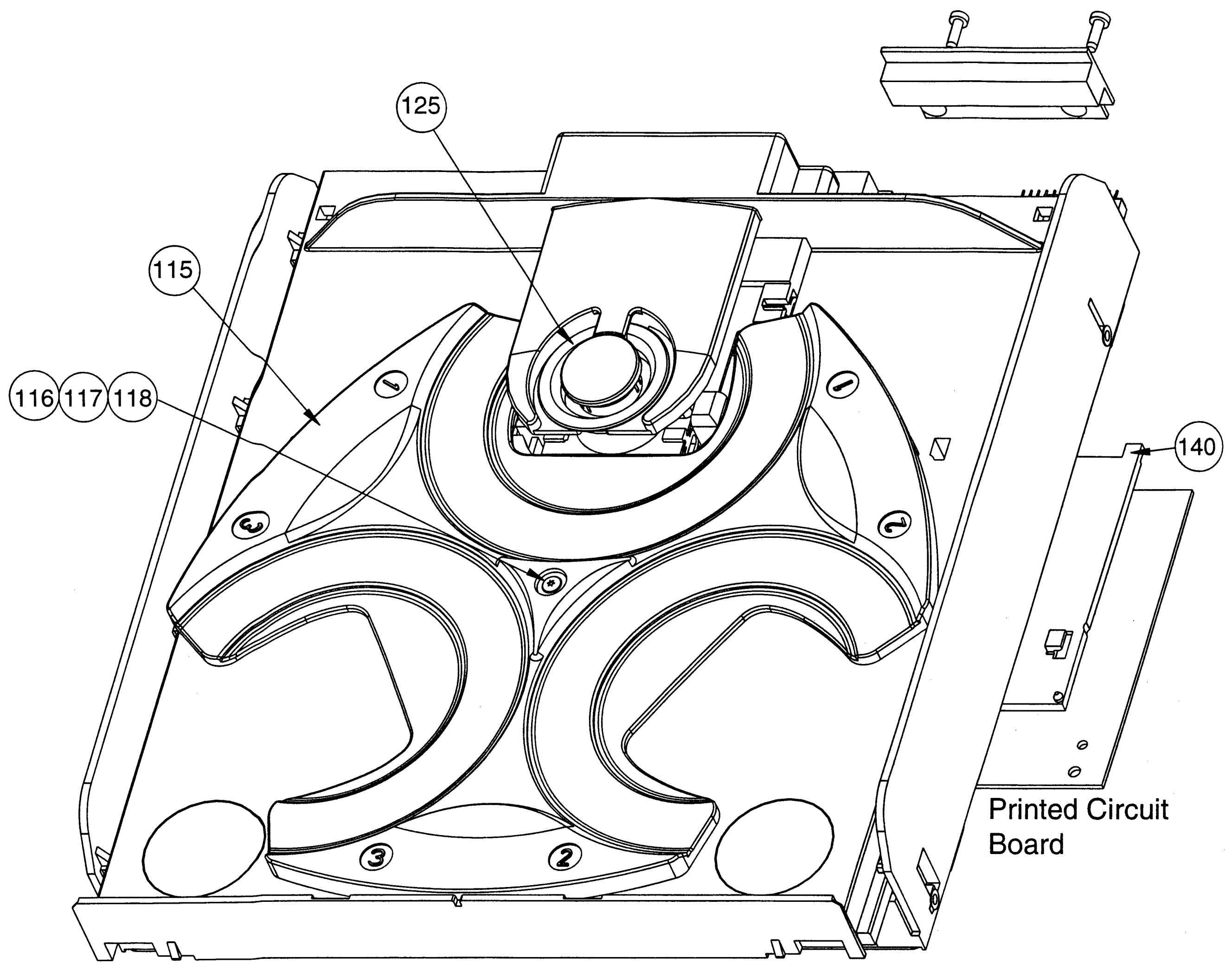
1450

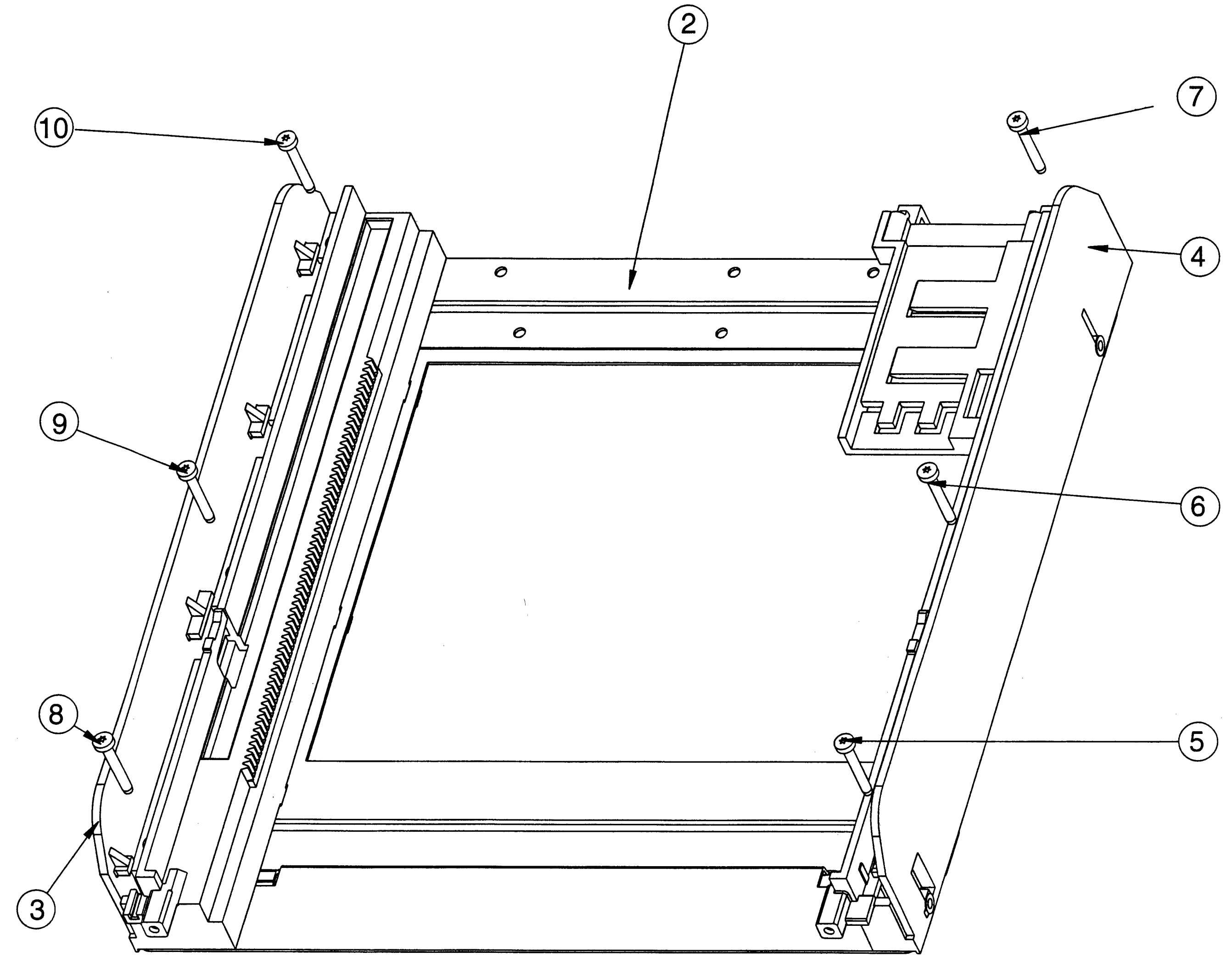
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3378 pt 3 dd wk014

20	D	3	2860	B	4	3829	C	4	9001	B	3
21	D	4	2861	B	4	3830	C	4	9002	A	5
1450	D	2	2862	B	4	3831	C	4	9003	A	5
1800	B	3	2863	C	3	3832	C	4	9004	B	5
1801	B	1	2864	C	3	3833	C	4	9007	B	3
1802	D	3	2865	C	3	3835	B	5	9008	C	3
1803	D	3	2866	C	4	3836	B	5	9009	B	5
1804	D	4	2867	B	4	3837	B	5	9010	A	5
1805	A	5	2868	C	3	3838	C	5	9011	B	3
1806	D	2	2869	B	4	3840	B	2	9012	B	2
1807	D	1	2870	C	3	3841	B	1	9013	B	5
1808	D	2	2871	B	4	3842	B	1	9014	B	5
1809	D	3	2872	B	4	3843	B	1	9015	C	4
1810	B	4	2873	B	5	3846	C	1	9016	C	5
1811	D	4	2874	B	4	3847	C	1	9017	C	5
1840	A	1	2875	B	4	3848	B	1	9018	C	5
1841	A	1	2876	C	3	3850	C	5	9019	C	4
1842	C	1	2877	B	5	3851	C	4	9020	C	4
1843	C	1	2878	B	5	3852	C	5	9021	C	4
1850	C	5	2879	B	5	3853	C	5	9022	C	5
1851	A	4	2880	B	5	3854	B	5	9023	C	4
1852	C	5	2881	B	5	3855	B	5	9024	C	4
1853	C	5	2882	B	5	3856	B	5	9025	C	3
2800	B	2	2883	B	5	3857	B	5	9026	C	2
2801	A	1	2884	A	5	3858	A	5	9027	B	2
2802	A	3	2885	D	3	3859	A	5	9028	A	2
2803	A	2	2886	D	4	3860	C	5	9029	A	4
2804	A	4	2887	D	2	3861	B	5	9030	A	5
2805	A	3	2890	A	2	3862	C	4	9031	A	2
2806	A	3	2891	A	3	3863	C	4	9032	B	2
2808	C	2	2892	A	5	3864	B	4	9033	B	2
2810	C	2	2893	A	5	3865	B	4	9034	B	2
2811	B	2	3800	A	2	3866	C	4	9035	B	2
2812	C	2	3801	A	3	3867	B	5	9036	B	2
2813	C	2	3802	A	3	3869	B	4	9037	B	5
2814	A	2	3803	A	3	3870	B	4	9039	A	4
2816	A	4	3804	A	2	3872	C	4	9040	A	3
2817	C	2	3805	A	3	3873	A	5	9041	A	5
2818	A	4	3806	D	5	3874	B	5	9043	A	5
2820	B	3	3807	D	4	3875	B	5	9044	A	5
2821	B	3	3809	C	2	3876	B	5	9045	A	5
2822	B	2	3810	B	2	3877	C	5	9046	D	2
2823	C	3	3811	C	2	3878	C	5	9050	C	5
2824	C	3	3812	A	4	3879	C	5	9051	B	5
2825	C	3	3813	A	2	3880	C	5	----		
2826	C	4	3814	A	2	6850	A	5	9005	C	5
2827	C	4	3816	C	2	6860	B	5	9006	C	4
2828	D	5	3817	A	4	6875	C	4	9038	B	4
2829	D	4	3819	C	2	6876	C	3	9047	D	3
2840	C	1	3820	B	2	7800	A	2	9048	D	5
2841	C	1	3821	B	3	7810	C	2			
2842	B	1	3822	B	3	7820	B	3			
2843	B	1	3823	C	3	7821	C	3			
2844	C	1	3824	C	3	7822	C	4			
2850	C	4	3825	C	3	7823	C	4			
2851	B	5	3826	C	3	7840	B	1			
2852	C	4	3827	C	3	7850	C	5			
2853	B	5	3828	C	4	7860	B	5			

EXPLODED VIEW





MECHANICAL PARTS LIST - 3 VIDEO CD MODULE

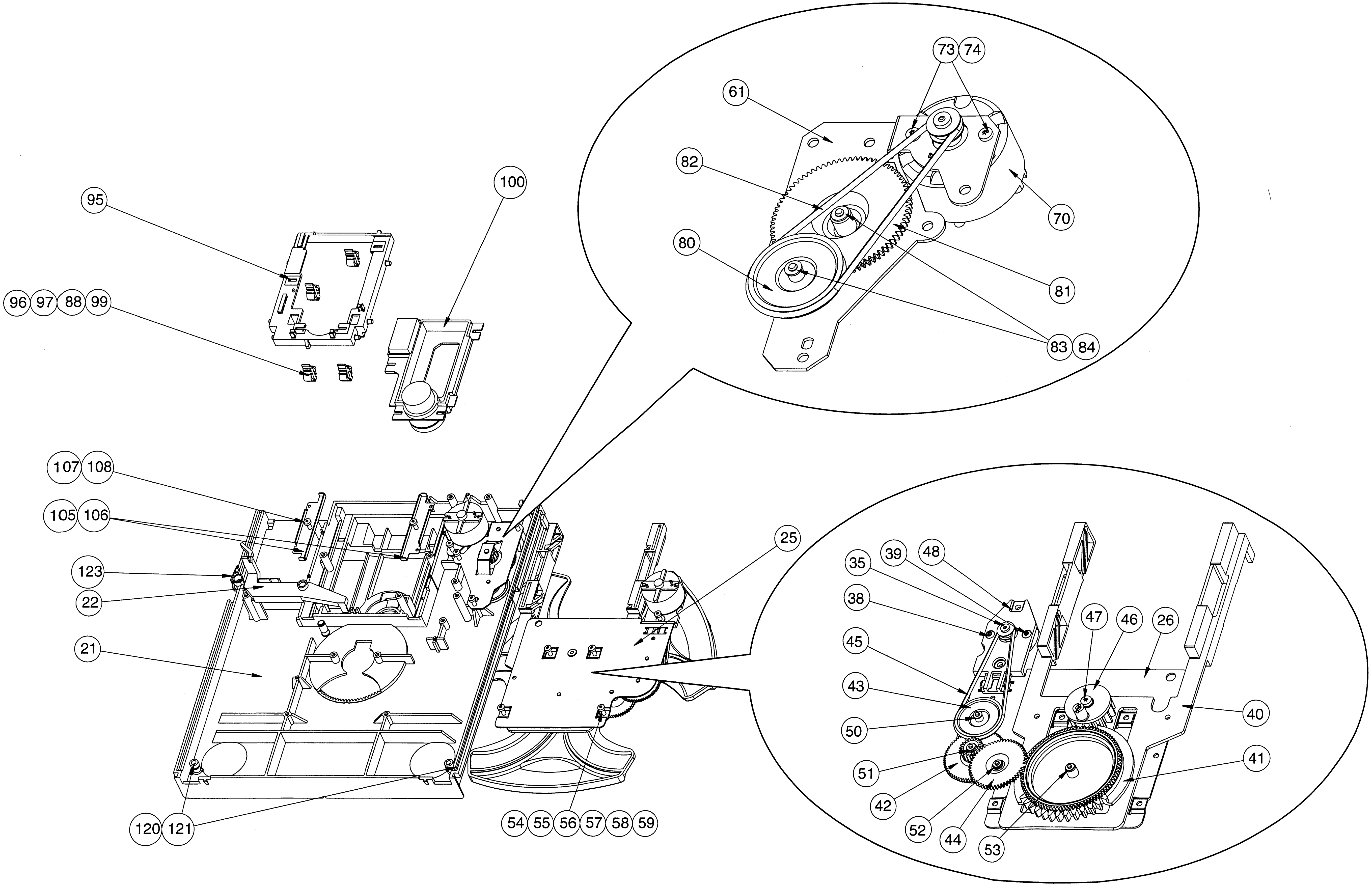
	4822 390 10136	Polylub GLY801 (Grease)	42	4822 522 10492	Gear Wheel
3	4822 463 11008	Guide Left	43	4822 528 10937	Pulley
4	4822 463 11009	Guide Right	44	4822 522 10493	Idler Wheel
21	4822 441 11615	Drawer	45	4822 358 10115	Belt
22	4822 402 10088	Bracket Tumbler	46	4822 466 10735	Eccentric Gear Wheel
35	4822 361 10753	Carrousel Motor	50	4822 532 12364	Washer
38	4822 502 12548	Screw M2.6 X 3,5	51	4822 532 12364	Washer
39	4822 502 12548	Screw M2.6 X 3,5	52	4822 532 12364	Washer
40	4822 463 11011	Slide	53	4822 532 12364	Washer
41	4822 522 10509	Control Disc	70	4822 361 10753	Carrousel Motor

MECHANICAL PARTS LIST - 3 VIDEO CD MODULE

73	4822 502 12548	Screw M2.6 X 3,5	98	4822 325 50215	Suspension
74	4822 502 12548	Screw M2.6 X 3,5	99	4822 325 50215	Suspension
80	4822 528 10937	Pulley	100	4822 691 10615	CD Drive VAM1201
81	4822 522 10494	Gear Drawer	115	4822 466 10736	Carrousel
82	4822 358 10115	Belt	117	4822 532 12365	Bush Drawer
83	4822 532 12364	Washer	120	4822 532 51756	Damping Grommet
84	4822 532 12364	Washer	121	4822 532 51756	Damping Grommet
95	4822 404 10894	Support	123	4822 402 10085	Switch Bracket
96	4822 325 50215	Suspension	125	4822 401 11708	Disc Clamp VAM1201 3CDC
97	4822 325 50215	Suspension	140	4822 466 10734	Plate

Note: Only the parts mentioned in this list are normal service spare parts.

EXPLODED VIEW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MISCELLANEOUS

1800	4822 267 51453	Flex Socket 12pin Hort.
1803	4822 267 31996	Video-out Socket
1805	4822 267 51322	Flex Socket 15pin Hort.
1806	4822 265 10981	Flex Socket 15pin Vert.
1810	4822 242 10566	X'tal Resonator 8,4672MHz
1850	5322 242 73686	Ceram Resonator 12MHz
1851	4822 276 13503	Detector Switch
1852	4822 276 13503	Detector Switch
1853	4822 276 13503	Detector Switch
8002	4822 320 11974	Flex Cable 15pin 19cm

CAPACITORS

2800	4822 126 12882	100nF +80/-20% 50V
2801	4822 124 81286	47µF 20% 16V
2802	4822 122 33197	1nF 10% 50V
2803	4822 122 33197	1nF 10% 50V
2804	4822 126 12882	100nF +80/-20% 50V
2805	4822 126 12882	100nF +80/-20% 50V
2806	4822 126 12882	100nF +80/-20% 50V
2808	4822 126 13098	5,6nF 20% 16V
2810	4822 126 12882	100nF +80/-20% 50V
2811	4822 124 81286	47µF 20% 16V
2812	4822 121 51387	10nF 20% 16V
2813	4822 126 12882	100nF +80/-20% 50V
2814	4822 124 41796	22µF 20% 16V
2816	4822 126 12787	330pF 10% 50V
2817	4822 126 13098	5,6nF 20% 16V
2818	4822 126 12787	330pF 10% 50V
2820	4822 126 12882	100nF +80/-20% 50V
2821	4822 124 80483	47µF 20% 6,3V
2822	4822 122 33197	1nF 10% 50V
2823	4822 122 33197	1nF 10% 50V
2824	4822 122 33197	1nF 10% 50V
2825	4822 126 12882	100nF +80/-20% 50V
2826	4822 126 12882	100nF +80/-20% 50V
2827	4822 126 11585	22nF +80/-20% 25V
2840	4822 124 40433	47µF 20% 25V
2841	4822 126 12882	100nF +80/-20% 50V
2842	4822 126 11585	22nF +80/-20% 25V
2843	4822 124 11947	10µF 20% 16V
2844	4822 126 11585	22nF +80/-20% 25V
2850	4822 126 12882	100nF +80/-20% 50V
2851	4822 124 11947	10µF 20% 16V
2853	4822 122 33519	470pF 10% 50V
2860	4822 126 12882	100nF +80/-20% 50V
2861	4822 124 41796	22µF 20% 16V
2862	4822 126 12882	100nF +80/-20% 50V
2863	4822 122 10466	220pF 10% 50V
2864	4822 122 10466	220pF 10% 50V
2865	4822 122 10466	220pF 10% 50V
2866	4822 122 10466	220pF 10% 50V
2867	4822 122 10466	220pF 10% 50V
2868	4822 122 10466	220pF 10% 50V
2869	4822 126 11585	22nF +80/-20% 25V
2870	4822 126 12148	2,7nF 10% 16V
2871	4822 122 33848	47pF 5% 50V
2872	4822 126 11585	22nF +80/-20% 25V
2873	4822 126 12882	100nF +80/-20% 50V
2874	4822 122 33191	22pF 5% 50V
2875	4822 122 33191	22pF 5% 50V
2877	4822 126 12882	100nF +80/-20% 50V
2878	4822 126 12882	100nF +80/-20% 50V
2879	4822 126 12882	100nF +80/-20% 50V
2881	4822 122 33195	100pF 10% 50V
2882	4822 122 33197	1nF 10% 50V
2883	4822 122 33195	100pF 10% 50V
2884	4822 122 33195	100pF 10% 50V
2885	4822 121 51387	10nF 20% 16V
2890	4822 124 80483	47µF 20% 6,3V
2891	4822 124 41643	100µF 20% 16V

RESISTORS

3800	4822 052 10228	⚠ 2R2 5% 0,33W
3801	4822 116 52249	1k8 5% 0,5W
3802	4822 116 83884	47k 5% 0,5W
3803	4822 116 83884	47k 5% 0,5W
3804	4822 116 52231	820R 5% 0,5W
3805	4822 116 52257	22k 5% 0,5W
3809	4822 116 52238	12k 5% 0,5W
3810	4822 052 10228	⚠ 2R2 5% 0,33W
3811	4822 116 52231	820R 5% 0,5W
3812	4822 116 52238	12k 5% 0,5W
3813	4822 050 11002	1k 1% 0,4W
3814	4822 050 11002	1k 1% 0,4W
3816	4822 116 52228	680R 5% 0,5W
3817	4822 116 52238	12k 5% 0,5W
3819	4822 116 52238	12k 5% 0,5W
3820	4822 052 10228	⚠ 2R2 5% 0,33W
3821	4822 052 10228	⚠ 2R2 5% 0,33W
3822	4822 116 52234	100k 5% 0,5W
3823	4822 050 21003	10k 1% 0,6W
3824	4822 116 52245	150k 5% 0,5W
3825	4822 116 52234	100k 5% 0,5W
3826	4822 116 52256	2k2 5% 0,5W
3827	4822 116 52226	560R 5% 0,5W
3828	4822 116 52234	100k 5% 0,5W
3829	4822 116 52175	100R 5% 0,5W
3830	4822 050 11002	1k 1% 0,4W
3831	4822 116 52234	100k 5% 0,5W
3832	4822 116 52234	100k 5% 0,5W
3833	4822 050 21003	10k 1% 0,6W
3835	4822 116 52257	22k 5% 0,5W
3836	4822 116 52257	22k 5% 0,5W
3837	4822 116 52257	22k 5% 0,5W
3838	4822 116 52257	22k 5% 0,5W
3840	4822 052 10228	⚠ 2R2 5% 0,33W
3841	4822 116 52269	3k3 5% 0,5W
3842	4822 116 52234	100k 5% 0,5W
3843	4822 116 52234	100k 5% 0,5W
3846	4822 116 52269	3k3 5% 0,5W
3847	4822 116 52234	100k 5% 0,5W
3848	4822 116 52234	100k 5% 0,5W
3850	4822 052 10478	⚠ 4R7 5% 0,33W
3851	4822 116 83866	1M 5% 0,5W
3852	4822 050 21003	10k 1% 0,6W
3853	4822 050 21003	10k 1% 0,6W
3854	4822 050 21003	10k 1% 0,6W
3858	4822 116 52195	47R 5% 0,5W
3859	4822 116 83883	470R 5% 0,5W
3860	4822 052 10228	⚠ 2R2 5% 0,33W
3861	4822 052 10228	⚠ 2R2 5% 0,33W
3862	4822 050 21003	10k 1% 0,6W
3863	4822 050 21003	10k 1% 0,6W
3864	4822 116 52272	330k 5% 0,5W
3865	4822 116 52257	22k 5% 0,5W
3866	4822 050 11002	1k 1% 0,4W
3867	4822 116 52285	470k 5% 0,5W
3869	4822 116 52219	330R 5% 0,5W
3870	4822 116 83866	1M 5% 0,5W
3872	4822 116 52195	47R 5% 0,5W
3873	4822 116 52175	100R 5% 0,5W
3874	4822 116 52175	100R 5% 0,5W
3875	4822 116 52175	100R 5% 0,5W
3876	4822 116 52175	100R 5% 0,5W
3877	4822 116 83883	470R 5% 0,5W
3878	4822 116 83883	470R 5% 0,5W
3879	4822 116 83883	470R 5% 0,5W
3880	4822 116 83883	470R 5% 0,5W

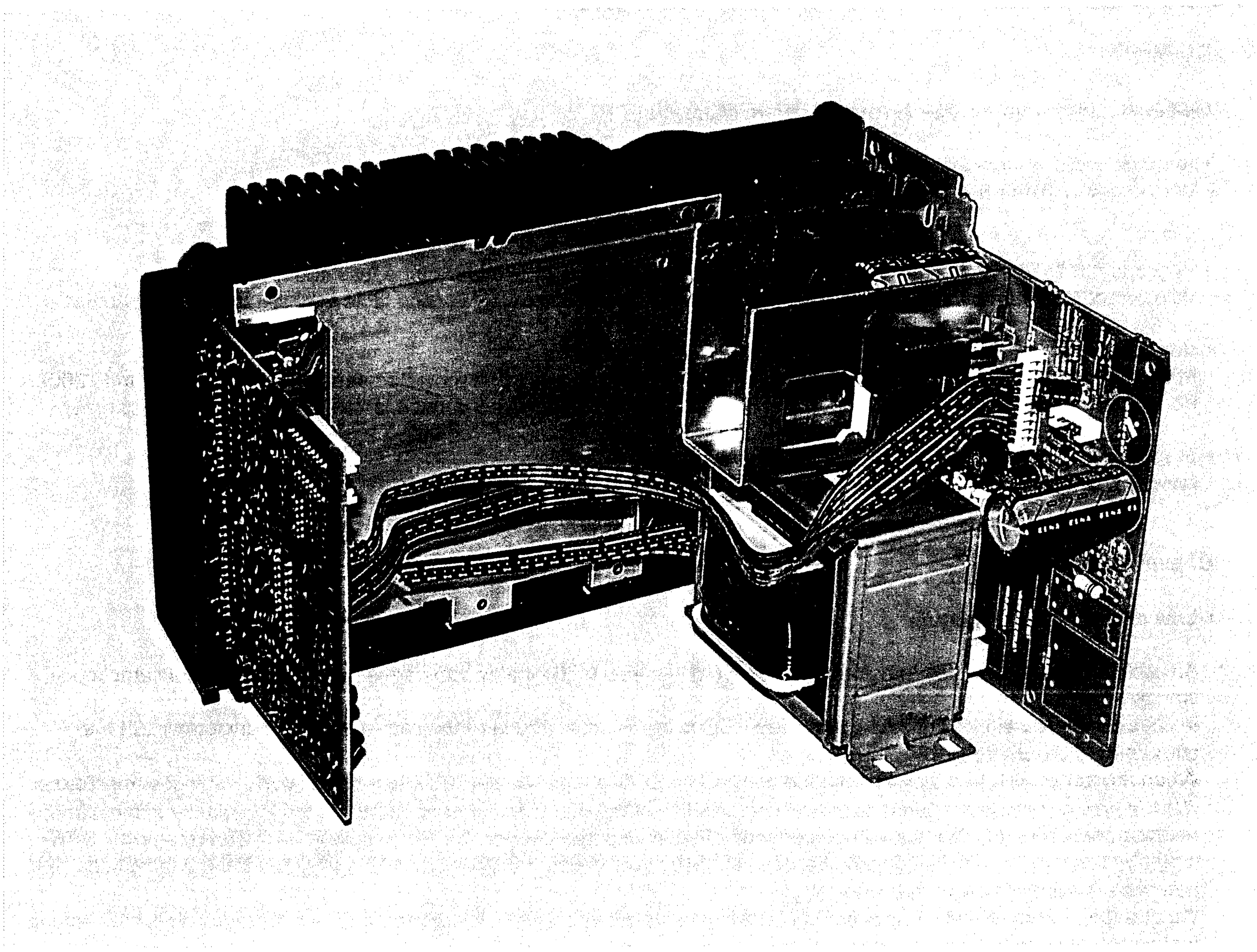
DIODES

6850	4822 130 30621	1N4148
6860	4822 130 30613	BAW62
6875	4822 130 30613	BAW62
6876	4822 130 30613	BAW62

TRANSISTORS & INTEGRATED CIRCUITS

7800	4822 209 32852	TDA7073A/N2
7810	4822 209 32852	TDA7073A/N2
7820	4822 209 16855	TDA1300T
7821	4822 130 40959	BC547B
7822	4822 130 44568	BC557B
7823	4822 130 40959	BC547B
7840	4822 209 32852	TDA7073A/N2
7850	9352 624 55557	OM5284EB05B
7860	4822 209 12752	SAA7378GP/M1

Note: Only the parts mentioned in this list are normal service spare parts.



POWER 4-99 Module

(2 Channel Version)

stage .7

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Component layout 11-6
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Circuit diagram Power stage 11-9
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CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

***General** (pos. numbers refer to circuit diagram chapter 11-7)*

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
  120VAC for /37
  220-240VAC for /22/25/30/33/34

  Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
  In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- European versions – *"low power standby feature"*
  For detailed description see below.

Circuit details:

- **Low power standby feature**

  An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.
  In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.
  When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.
  Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

- **DC voltages +A, +B1/+B2, +C**

  These voltages supply the Super Class G amplifier, described later in this chapter.
  The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several "tricky" details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

  Generation of +A

  Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 11-15).

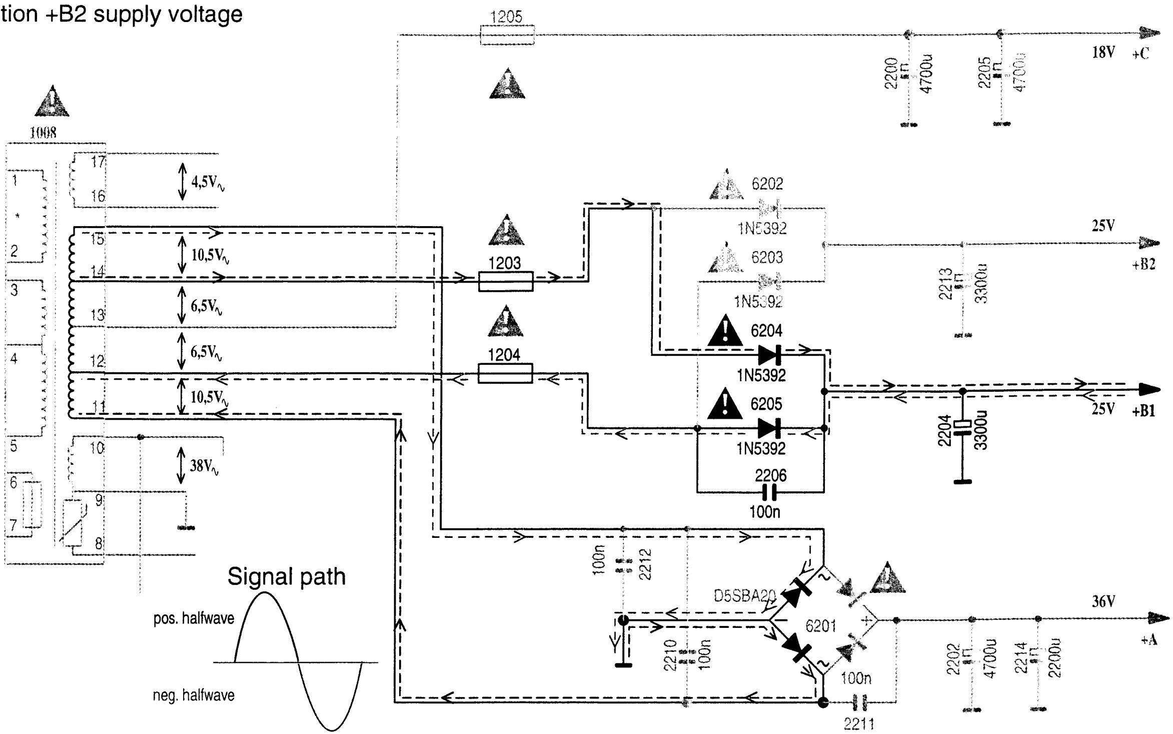
  Generation of +B1/+B2

  The power supply is designed to cover both, 2-channel and 4-channel application.
  While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

  The supply for 2-channel versions consists of one full wave rectifier:
  – 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
  – +B2 is connected in parallel with a bridge wire.

  The supply for 4-channel versions consists of two separate full wave rectifiers:
  – 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
  – 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
  using approx. 70% secondary winding of mains transformer (pin 11-14 respectively pin 12-15).
  As example for generation of +B2 see picture 1.

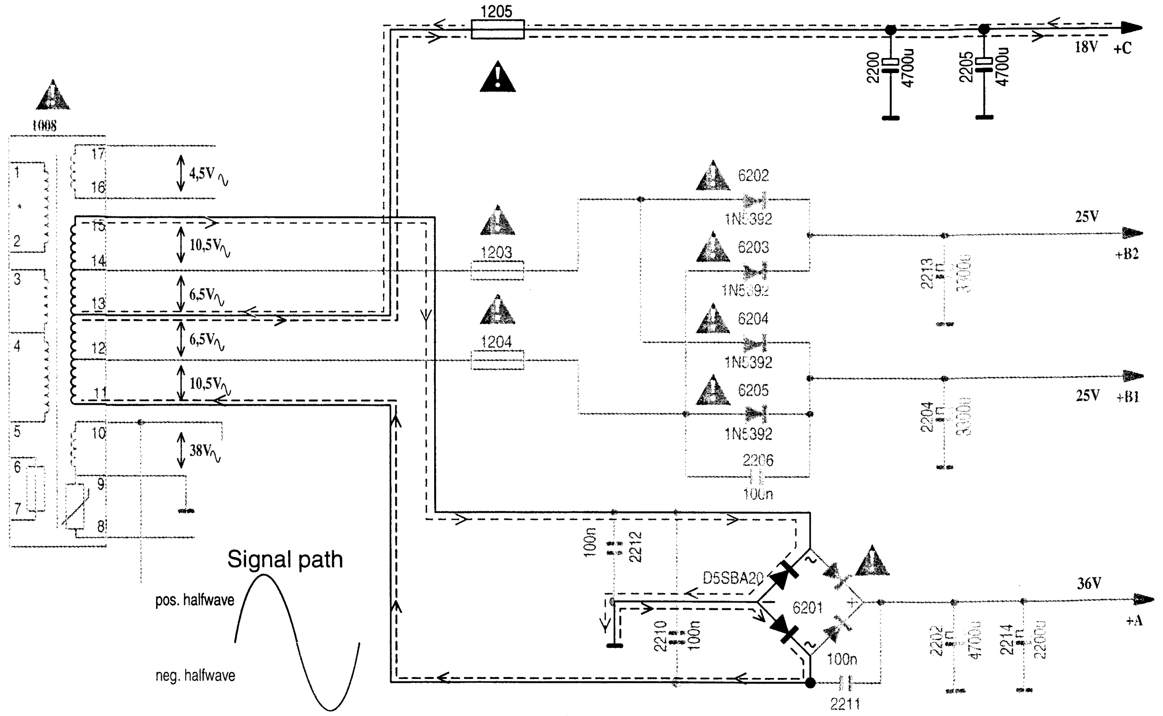
Generation +B2 supply voltage


1205
18V +C
2200 4700u
2205 4700u
1008
17
16
4,5V
15
14
10,5V
13
6,5V
12
6,5V
11
10,5V
10
38V
9
8
1
2
3
4
5
6
7
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213 3300u
25V +B1
2204 3300u
100n 2212
D5SBA20
6201
2210 100n
100n
2211
36V
+A
2202 4700u
2214 2200u
Signal path
pos. halfwave
neg. halfwave

picture 1

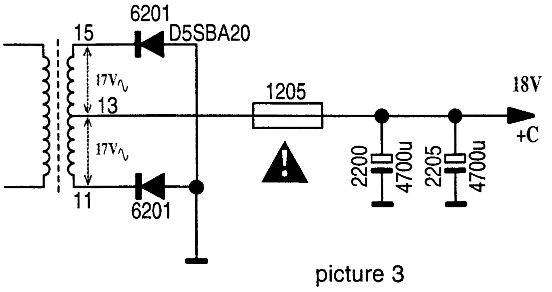
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.


1205
18V +C
2200 4700u
2205 4700u
1008
17
16
4,5V
15
14
10,5V
13
6,5V
12
6,5V
11
10,5V
10
38V
9
8
1
2
3
4
5
6
7
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213 3300u
25V +B1
2204 3300u
100n 2212
D5SBA20
6201
2210 100n
100n
2211
36V
+A
2202 4700u
2214 2200u
Signal path
pos. halfwave
neg. halfwave

picture 2

Simplified


6201
15
D5SBA20
17V
13
17V
11
6201
1205
18V
+C
2200 4700u
2205 4700u

picture 3

Circuit details (continoued):

- **Supply voltages for FTD** (**F**luorescent **T**ube **D**isplay)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  - 4,5VAC for FTD heating (transformer pin 16/17)
  - -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line.
  In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

Circuit details (continoued):

VCD- Supply:

Is a provision for versions with a Video CD Player.

This circuitry consists of a switched supply with a regulator to 5,1V (±0,15V).

- **Switching on/off** is done via the VCD_ON line from the microprocessor (H=on, L=off). If the VCD_ON line is high - transistor 7236 becomes conductive. This causes transistor 7238 to switch through. +5VCD is available. If the VCD_ON is low - transistor 7236 is blocked → no base current through 7238 → transistor 7238 is blocked too → +5VCD is switched off.

- **Regulation** is done via Z- diode 6244 and transistor 7237.
  If the +5V CD exceeds 5,1V the basis of transistor 7237 becomes higher than 0,6V via Z- diode 6244. Consequently transistor 7237 becomes conductive. This causes a reduced base current through 7236. Transistor 7236 becomes less conductive and reduces the base current trough 7238. Transistor 7238 becomes less conductive too and reduces the +5VCD.

Amplifier:

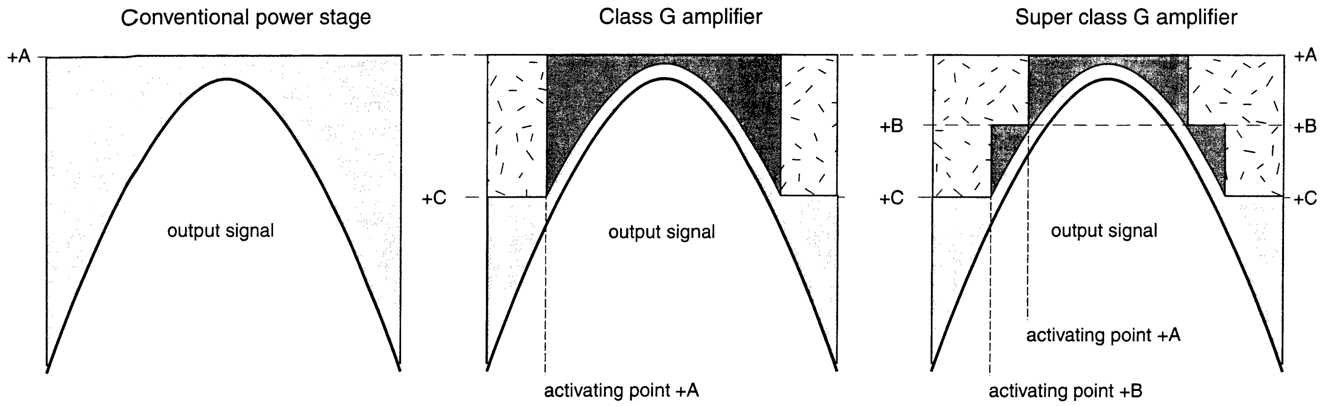
Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the µP.
  High level (approx. 4,5V): power amplifiers switched on
  Low level (approx. 0V): power amplifiers switched off

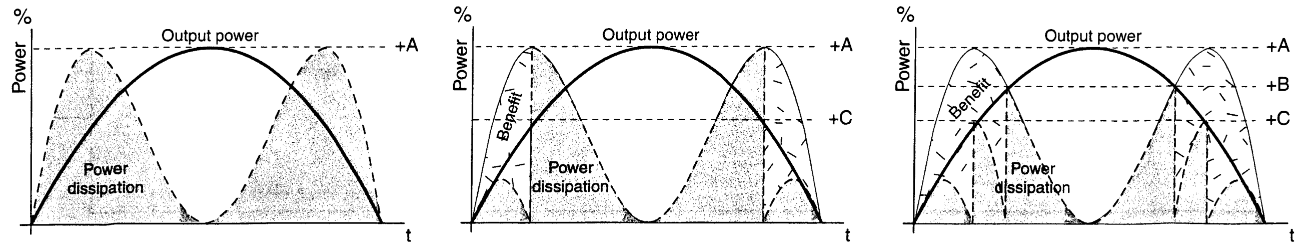
- Super class G - operation

  The power amplifiers operate as so-called super class G - amplifiers:
  The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
  Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
  ⇒ +C (+18V) for low output power
  ⇒ +B (+25V) for medium output power
  ⇒ +A (+36V for high output power

Principle / benefit of Super Class G



☐ Voltage drop on power stage IC
▨ Voltage drop on switching transistor(s)
▧ Benefit - voltage drop on switching transistor(s) reduces total power dissipation



- advantages:
  - best efficiency
  - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
  - reduced power dissipation at the amplifier ICs results in
    - less junction temperature and better reliability
    - possibility of higher output power with smaller cooling fin
    - smaller size

- Functional description of the super class G - circiuitry used in Power4-module

  The DC-level on the amplifier output pins is normally Vcc/2.
  With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.
  When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the higher DC supply +B1 slowly to the power stages.
  This does not end up in a hard switching but in a smooth regulating because Vcc is coupled back to the emitter of 7315 via Zener diode 6310. As soon as Vcc increases also the level on emitter 7315 is increased by a 3,9V lower level than Vcc.
  When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.
  7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.
  With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to Vcc (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.
  When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual Vcc. Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

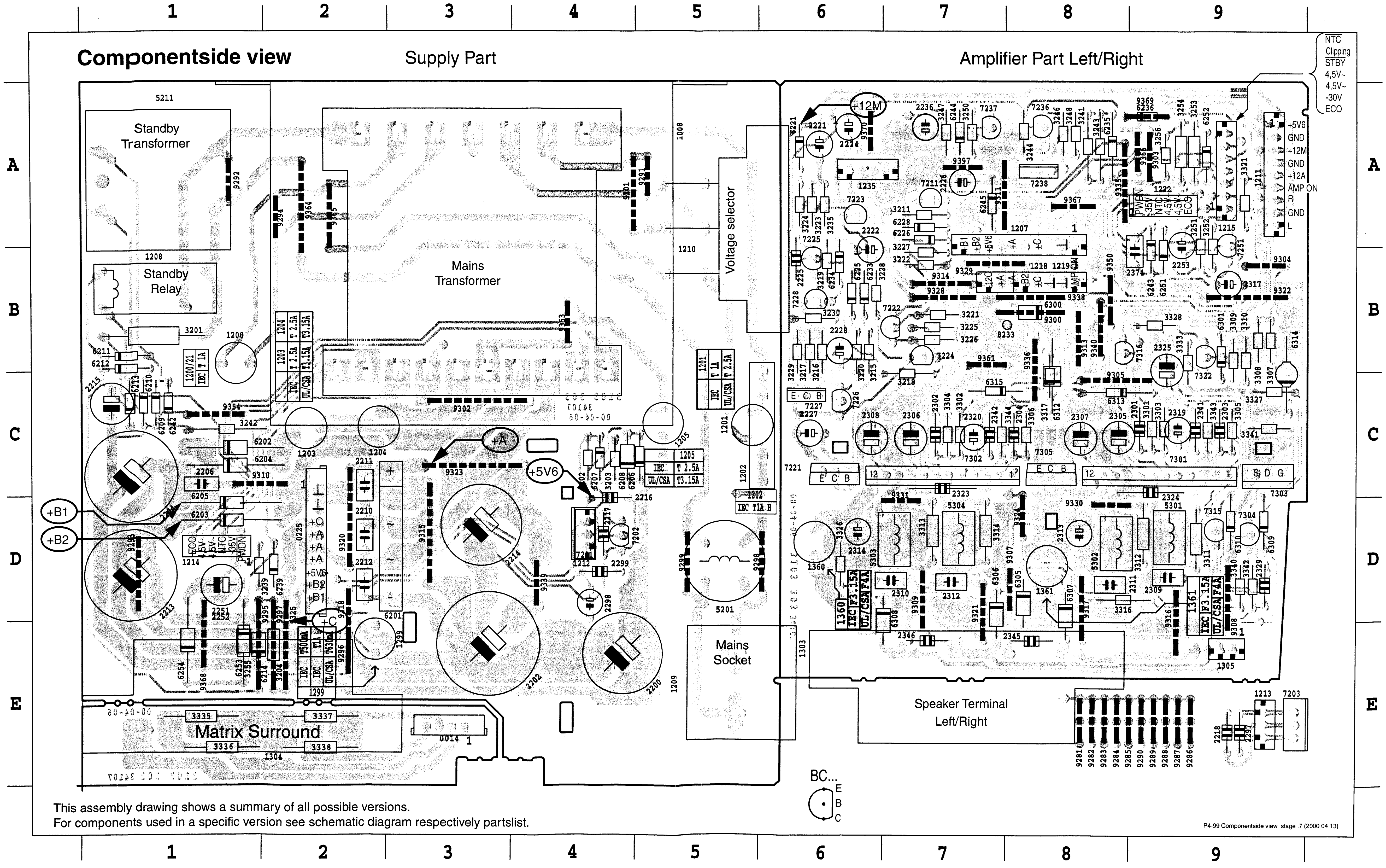
- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.

- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.

- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system
  (e.g. FB206,FB208).

0014	E 3	1214	D 1	1360	D 6	2217	D 4	2298	D 4	2311	D 8	2345	E 8	3220	B 6	3242	C 1	3256	A 9	3312	D 9
0225	D 2	1212	D 4	1361	D 8	2218	E 9	2299	D 4	2312	D 7	2346	E 7	3221	B 7	3241	A 8	3302	C 7	3314	D 7
1008	A 3	1211	A 9	2200	E 5	2221	A 6	2297	E 9	2314	D 6	2374	B 9	3222	B 7	3243	A 8	3301	C 9	3316	D 8
1200	B 1	1213	E 9	2204	C 1	2222	B 6	2302	C 7	2313	D 8	3201	B 1	3223	A 6	3244	A 8	3304	C 7	3317	C 8
1203	C 2	1215	A 9	2202	E 4	2224	A 6	2301	C 9	2317	B 9	3202	C 4	3224	A 6	3246	A 8	3303	C 9	3321	A 9
1201	C 5	1218	B 8	2206	C 1	2225	B 6	2303	C 9	2320	C 7	3204	E 2	3225	B 7	3247	A 7	3305	C 9	3326	D 6
1204	C 2	1219	B 8	2210	D 2	2226	A 7	2304	C 8	2319	C 9	3203	C 4	3226	B 7	3248	A 8	3306	C 8	3335	E 1
1202	C 5	1222	A 9	2211	C 2	2227	C 6	2305	C 8	2323	C 7	3211	A 7	3227	B 7	3255	E 1	3307	B 9	3327	C 9
1208	B 1	1235	A 6	2212	D 2	2228	B 6	2306	C 7	2324	C 9	3215	B 6	3228	B 6	3250	A 7	3308	B 9	3336	E 1
1205	C 5	1299	E 2	2213	D 1	2236	A 7	2308	C 6	2325	B 9	3216	B 6	3229	B 6	3251	A 9	3309	B 9	3328	B 9
1209	E 5	1304	E 1	2215	C 1	2251	D 1	2307	C 8	2329	D 9	3217	B 6	3230	B 6	3252	B 9	3310	B 9	3337	E 2
1207	B 8	1303	E 7	2214	D 4	2252	D 1	2310	D 7	2342	C 7	3218	C 7	3239	D 1	3253	A 9	3311	D 9	3338	E 2
1210	A 5	1305	E 9	2216	D 4	2253	A 9	2309	D 9	2341	C 9	3219	B 6	3235	A 6	3254	A 9	3313	D 7	3333	B 9

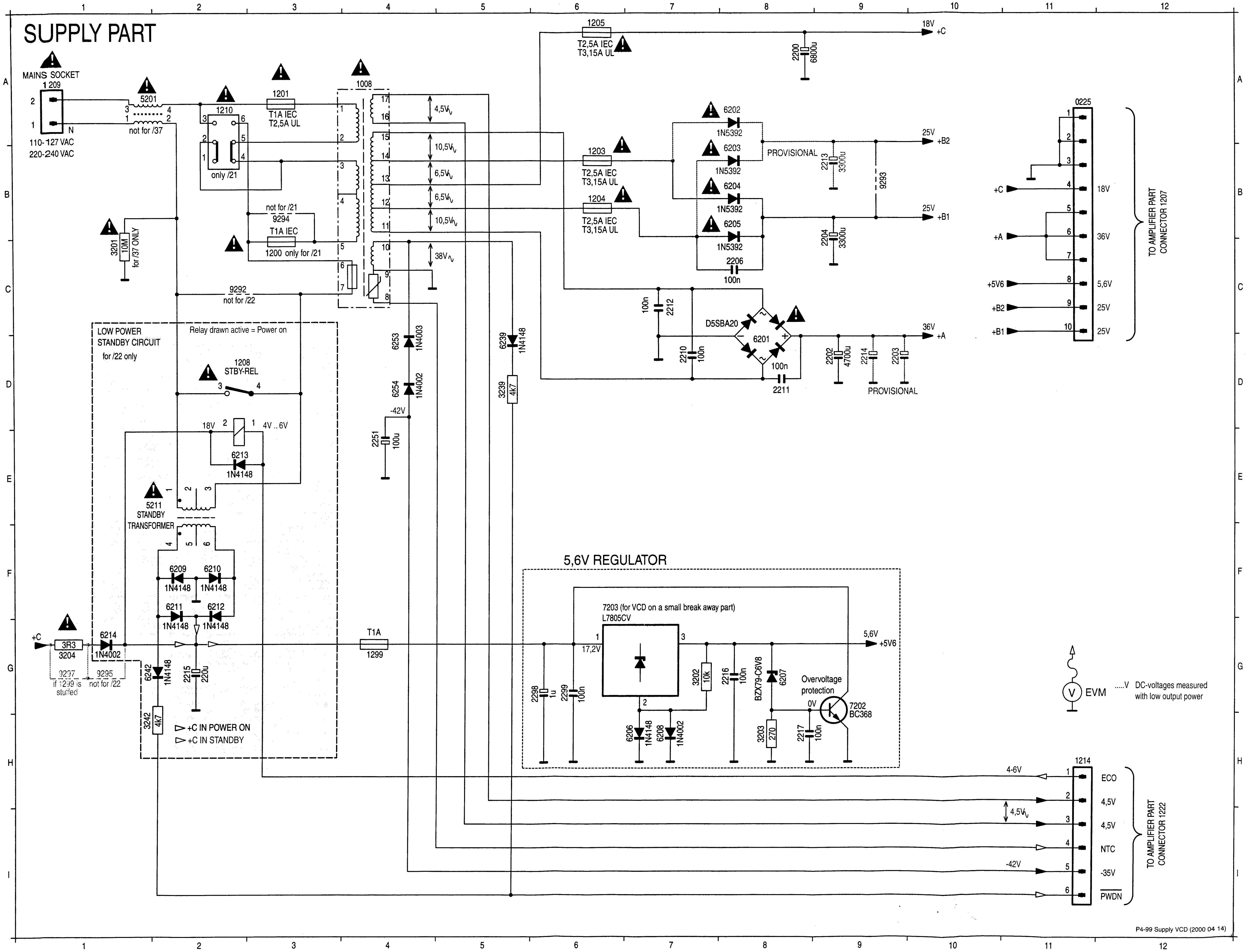
3340	D 9	6203	D 1	6225	B 6	6254	E 1	6315	C 7	7228	B 6	8233	B 7	9288	E 9	9305	C 8	9325	E 2	9354	C 1
3341	C 9	6204	C 1	6226	A 7	6251	B 9	6314	C 9	7236	A 8	9281	E 8	9289	E 9	9307	D 8	9321	D 7	9353	B 4
3342	D 9	6205	D 1	6228	A 7	6252	A 9	7201	D 4	7237	A 7	9282	E 8	9296	E 2	9309	D 7	9322	B 9	9350	B 8
3344	C 7	6209	C 1	6233	B 6	6300	B 8	7202	D 4	7238	A 8	9283	E 8	9290	E 9	9308	D 9	9324	D 8	9364	A 2
3343	C 9	6206	C 5	6234	B 6	6301	B 9	7203	E 9	7251	A 9	9284	E 8	9297	E 2	9311	A 7	9328	B 7	9365	A 2
5201	D 5	6207	C 4	6239	D 2	6305	D 8	7211	A 7	7302	C 7	9285	E 8	9298	D 6	9315	D 3	9329	B 7	9361	B 7
5211	A 1	6210	C 1	6235	A 8	6306	D 7	7221	C 6	7301	C 9	9292	A 1	9299	D 5	9318	E 2	9330	D 8	9368	E 1
5301	D 9	6208	C 4	6242	C 1	6308	E 6	7222	B 7	7303	C 9	9293	D 1	9301	A 4	9313	B 8	9331	D 7	9366	A 9
5302	D 8	6211	B 1	6236	A 9	6307	D 8	7223	A 6	7304	D 9	9286	E 9	9302	C 3	9314	B 7	9335	A 8	9367	A 8
5303	D 7	6212	B 1	6244	A 7	6309	D 9	7224	B 7	7305	C 8	9287	E 9	9300	B 8	9320	D 2	9339	D 4	9370	A 6
5304	D 7	6213	C 1	6243	B 9	6310	D 9	7225	B 6	7315	D 9	9291	A 5	9310	C 1	9316	E 9	9336	B 8	9369	A 9
6201	D 2	6214	E 1	6245	A 7	6312	C 8	7226	C 6	7316	B 8	9294	A 2	9303	A 9	9317	D 8	9338	B 8	9397	A 7
6202	C 1	6221	A 6	6253	E 1	6313	C 8	7227	C 6	7322	B 9	9295	E 1	9304	B 9	9323	C 3	9340	B 8		


Componentside view
Supply Part
Amplifier Part Left/Right
Standby Transformer
Standby Relay
Mains Transformer
Voltage selector
Mains Socket
Matrix Surround
Speaker Terminal Left/Right
+12M
+A
+5V6
+B1
+B2
+C
NTC
Clipping
STBY
4,5V~
4,5V~
-30V
ECO
+5V6
GND
+12M
GND
+12A
AMP ON
R
GND
L
BC...
E
B
C
1
2
3
4
5
6
7
8
9
A
B
C
D
E

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P4-99 Componentside view stage .7 (2000 04 13)

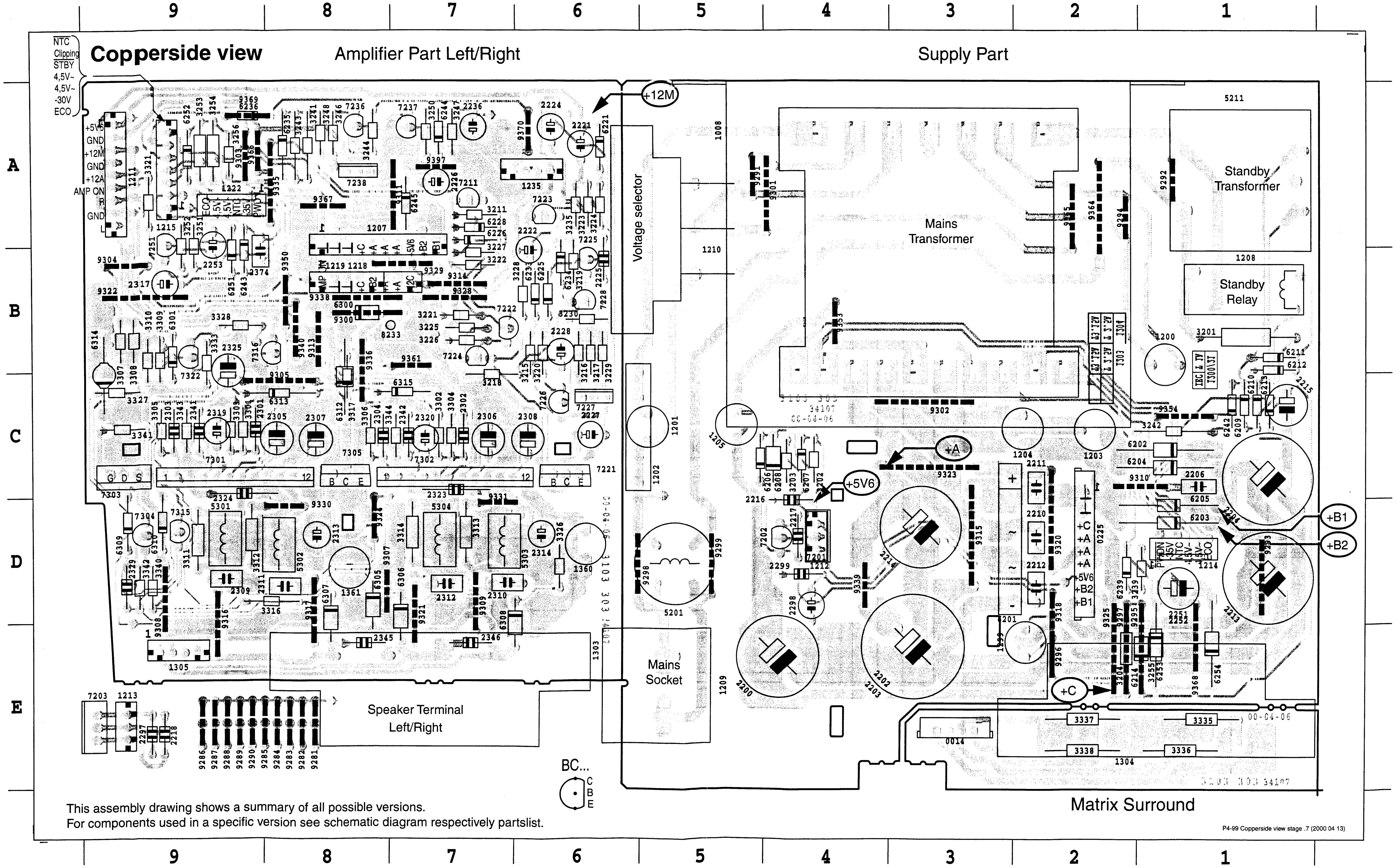
SUPPLY PART


MAINS SOCKET
1209
110-127 VAC
220-240 VAC
N
5201
not for /37
1210
only /21
1201
T1A IEC
T2,5A UL
1008
not for /21
9294
T1A IEC
1200 only for /21
3201
10M
for /37 ONLY
9292
not for /22
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1205
T2,5A IEC
T3,15A UL
18V
+C
2200
6800u
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
1203
T2,5A IEC
T3,15A UL
1204
T2,5A IEC
T3,15A UL
PROVISIONAL
2213
3300u
9293
2204
3300u
25V
+B2
25V
+B1
2206
100n
100n
2212
D5SBA20
6201
2210
100n
2211
36V
+A
2202
4700u
2214
2203
PROVISIONAL
6253
1N4003
6254
1N4002
-42V
2251
100u
6239
1N4148
3239
4k7
LOW POWER
STANDBY CIRCUIT
for /22 only
Relay drawn active = Power on
1208
STBY-REL
18V
4V ..6V
6213
1N4148
5211
STANDBY
TRANSFORMER
6209
1N4148
6210
1N4148
6211
1N4148
6212
1N4148
+C
3R3
3204
6214
1N4002
3297
if 1299 is stuffed
3295
not for /22
6242
1N4148
2215
220u
3242
4k7
+C IN POWER ON
+C IN STANDBY
T1A
1299
5,6V REGULATOR
7203 (for VCD on a small break away part)
L7805CV
17,2V
5,6V
+5V6
2298
1u
2299
100n
3202
10k
2216
100n
6206
1N4148
6208
1N4002
BZX79-C6V8
6207
Overvoltage
protection
0V
7202
BC368
3203
270
2217
100n
0225
18V
36V
5,6V
25V
25V
+C
+A
+5V6
+B2
+B1
TO AMPLIFIER PART
CONNECTOR 1207
1214
4-6V
4,5V
-42V
ECO
4,5V
4,5V
NTC
-35V
PWDN
TO AMPLIFIER PART
CONNECTOR 1222
EVM
.....V DC-voltages measured
with low output power
P4-99 Supply VCD (2000 04 14)

0225	A11
1008	A 4
1200	B 3
1201	A 3
1202	A 3
1203	B 6
1204	B 6
1205	A 6
1208	D 2
1209	B 1
1210	A 2
1214	I11
2200	A 8
2202	D 9
2203	D 9
2204	B 9
2206	C 8
2210	D 7
2211	D 8
2212	C 7
2213	B 9
2214	D 9
2215	G 2
2216	G 7
2217	H 8
2251	E 4
2298	G 5
2299	G 6
3201	C 1
3202	G 7
3203	H 8
3204	G 1
3239	D 5
3242	H 1
5201	A 1
5211	E 1
6201	C 8
6202	A 8
6203	A 8
6204	B 8
6205	B 8
6206	H 6
6207	G 8
6208	H 7
6209	F 2
6210	F 2
6211	F 2
6212	F 2
6213	E 2
6214	G 1
6239	D 5
6242	G 1
6253	D 4
6254	D 4
7201	F 6
7202	G 9
9292	C 2
9293	B 9
9294	B 3
9295	F 4

0014	E 3	1214	D 1	1360	D 6	2217	D 4	2298	D 4	2311	D 8	2345	E 8	3220	B 6	3242	C 1	3256	A 9	3312	D 9
0225	D 2	1212	D 4	1361	D 8	2218	E 9	2299	D 4	2312	D 7	2346	E 7	3221	B 7	3241	A 8	3302	C 7	3314	D 7
1008	A 3	1211	A 9	2200	E 5	2221	A 6	2297	E 9	2314	D 6	2374	B 9	3222	B 7	3243	A 8	3301	C 9	3316	D 8
1200	B 1	1213	E 9	2204	C 1	2222	B 6	2302	C 7	2313	D 8	3201	B 1	3223	A 6	3244	A 8	3304	C 7	3317	C 8
1203	C 2	1215	A 9	2202	E 4	2224	A 6	2301	C 9	2317	B 9	3202	C 4	3224	A 6	3246	A 8	3303	C 9	3321	A 9
1201	C 5	1218	B 8	2206	C 1	2225	B 6	2303	C 9	2320	C 7	3204	E 2	3225	B 7	3247	A 7	3305	C 9	3326	D 6
1204	C 2	1219	B 8	2210	D 2	2226	A 7	2304	C 8	2319	C 9	3203	C 4	3226	B 7	3248	A 8	3306	C 8	3335	E 1
1202	C 5	1222	A 9	2211	C 2	2227	C 6	2305	C 8	2323	C 7	3211	A 7	3227	B 7	3255	E 1	3307	B 9	3327	C 9
1208	B 1	1235	A 6	2212	D 2	2228	B 6	2306	C 7	2324	C 9	3215	B 6	3228	B 6	3250	A 7	3308	B 9	3336	E 1
1205	C 5	1299	E 2	2213	D 1	2236	A 7	2308	C 6	2325	B 9	3216	B 6	3229	B 6	3251	A 9	3309	B 9	3328	B 9
1209	E 5	1304	E 1	2215	C 1	2251	D 1	2307	C 8	2329	D 9	3217	B 6	3230	B 6	3252	B 9	3310	B 9	3337	E 2
1207	B 8	1303	E 7	2214	D 4	2252	D 1	2310	D 7	2342	C 7	3218	C 7	3239	D 1	3253	A 9	3311	D 9	3338	E 2
1210	A 5	1305	E 9	2216	D 4	2253	A 9	2309	D 9	2341	C 9	3219	B 6	3235	A 6	3254	A 9	3313	D 7	3333	B 9

3340	D 9	6203	D 1	6225	B 6	6254	E 1	6315	C 7	7228	B 6	8233	B 7	9288	E 9	9305	C 8	9325	E 2	9354	C 1
3341	C 9	6204	C 1	6226	A 7	6251	B 9	6314	C 9	7236	A 8	9281	E 8	9289	E 9	9307	D 8	9321	D 7	9353	B 4
3342	D 9	6205	D 1	6228	A 7	6252	A 9	7201	D 4	7237	A 7	9282	E 8	9296	E 2	9309	D 7	9322	B 9	9350	B 8
3344	C 7	6209	C 1	6233	B 6	6300	B 8	7202	D 4	7238	A 8	9283	E 8	9290	E 9	9308	D 9	9324	D 8	9364	A 2
3343	C 9	6206	C 5	6234	B 6	6301	B 9	7203	E 9	7251	A 9	9284	E 8	9297	E 2	9311	A 7	9328	B 7	9365	A 2
5201	D 5	6207	C 4	6239	D 2	6305	D 8	7211	A 7	7302	C 7	9285	E 8	9298	D 6	9315	D 3	9329	B 7	9361	B 7
5211	A 1	6210	C 1	6235	A 8	6306	D 7	7221	C 6	7301	C 9	9292	A 1	9299	D 5	9318	E 2	9330	D 8	9368	E 1
5301	D 9	6208	C 4	6242	C 1	6308	E 6	7222	B 7	7303	C 9	9293	D 1	9301	A 4	9313	B 8	9331	D 7	9366	A 9
5302	D 8	6211	B 1	6236	A 9	6307	D 8	7223	A 6	7304	D 9	9286	E 9	9302	C 3	9314	B 7	9335	A 8	9367	A 8
5303	D 7	6212	B 1	6244	A 7	6309	D 9	7224	B 7	7305	C 8	9287	E 9	9300	B 8	9320	D 2	9339	D 4	9370	A 6
5304	D 7	6213	C 1	6243	B 9	6310	D 9	7225	B 6	7315	D 9	9291	A 5	9310	C 1	9316	E 9	9336	B 8	9369	A 9
6201	D 2	6214	E 1	6245	A 7	6312	C 8	7226	C 6	7316	B 8	9294	A 2	9303	A 9	9317	D 8	9338	B 8	9397	A 7
6202	C 1	6221	A 6	6253	E 1	6313	C 8	7227	C 6	7322	B 9	9295	E 1	9304	B 9	9323	C 3	9340	B 8		



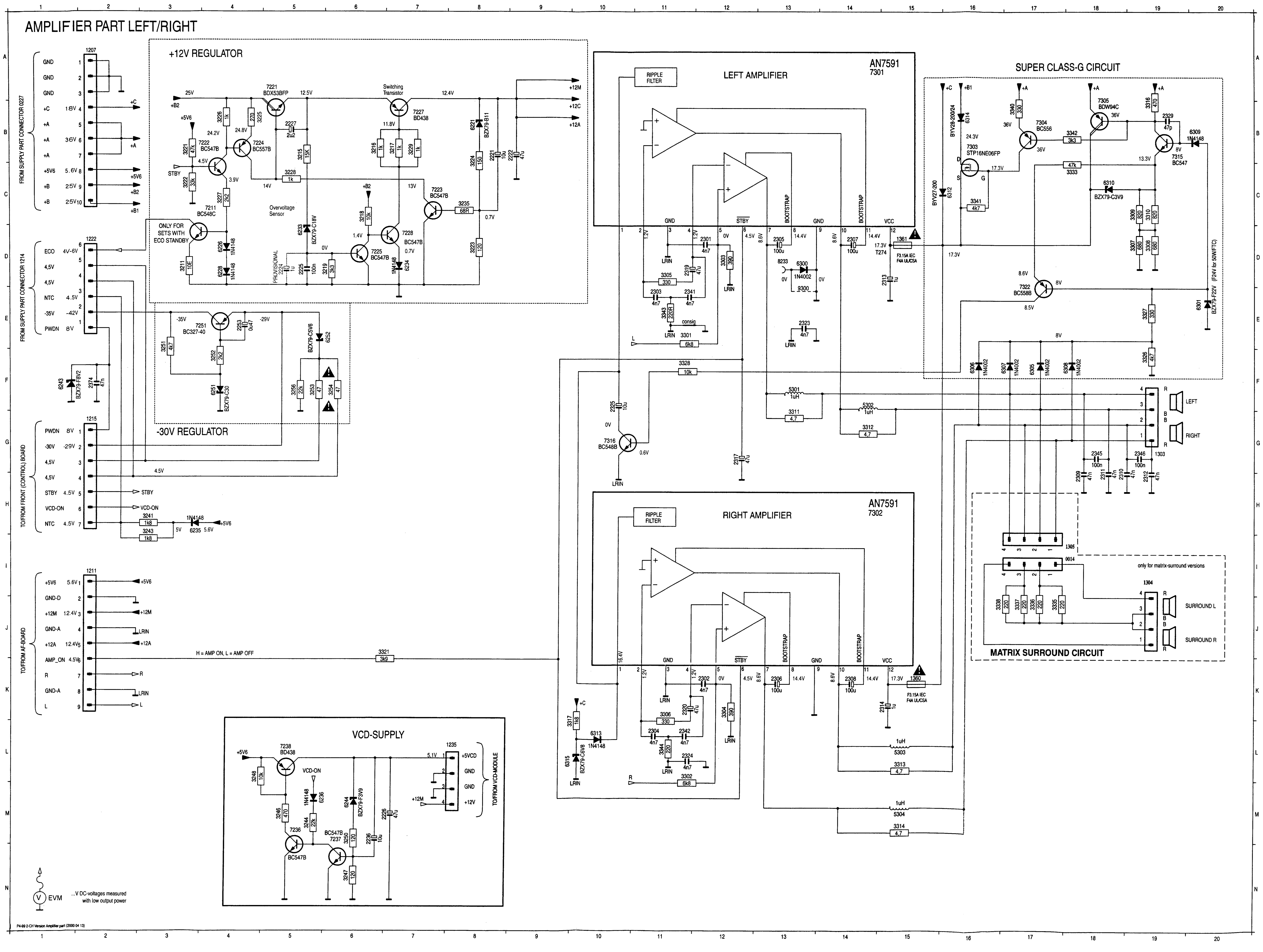
Copperside view

Amplifier Part Left/Right

Supply Part

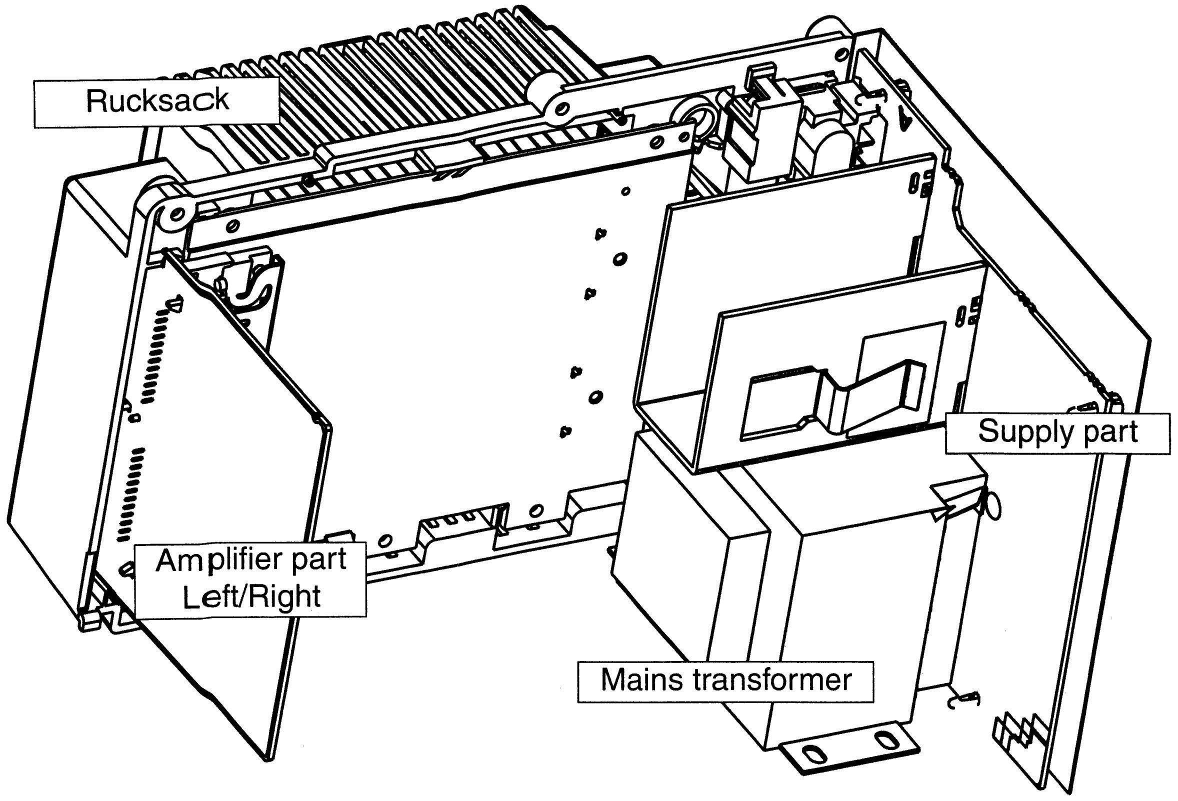
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P4-99 Copperside view stage .7 (2000 04 13)


AMPLIFIER PART LEFT/RIGHT
+12V REGULATOR
-30V REGULATOR
VCD-SUPPLY
LEFT AMPLIFIER
AN7591
7301
RIGHT AMPLIFIER
AN7591
7302
RIPPLE FILTER
SUPER CLASS-G CIRCUIT
MATRIX SURROUND CIRCUIT
only for matrix-surround versions
FROM SUPPLY PART CONNECTOR 0227
FROM SUPPLY PART CONNECTOR 1214
TO/FROM FRONT (CONTROL) BOARD
TO/FROM AF-BOARD
TO/FROM VCD-MODULE
GND
+C
+A
+5V6
+B
ECO
NTC
PWDN
STBY
VCD-ON
AMP_ON
+12M
+12A
GND-D
GND-A
LRIN
H = AMP ON, L = AMP OFF
ONLY FOR SETS WITH ECO STANDBY
Switching Transistor
Overvoltage Sensor
PROVISIONAL
BOOTSTRAP
VCC
LEFT
RIGHT
SURROUND L
SURROUND R
F3.15A IEC F4A UL/CSA
BDX53BFP
BD438
BC547B
BC557B
BC548C
BC327-40
STP16NE06FP
BC556
BDW94C
BC547
BC558B
BC548B
1N4148
1N4002
BZX79-C18V
BZX79-B11
BZX79-C6V8
BZX79-F8V2
BZX79-C30
BZX79-C3V9
BZX79-F3V9
BZX79-F22V (F24V for 50W/FTC)
BYV28-200/24
BYV27-200
EVM
...V DC-voltages measured with low output power
P4-99 2-CH Version Amplifier part (2000 04 13)

0014	I17
1207	A 2
1211	I 2
1215	G 2
1218	M20
1219	M20
1222	D 2
1235	L 7
1303	G19
1304	I19
1305	I17
1360	K15
1361	D15
2221	B 8
2222	B 9
2224	D 5
2225	D 5
2226	M 7
2227	B 5
2228	A 6
2236	M 6
2253	E 4
2301	D12
2302	K12
2303	E11
2304	L11
2305	D13
2306	K13
2307	D14
2308	K14
2309	H18
2310	H18
2311	H18
2312	H19
2313	D15
2314	K15
2317	G12
2319	D11
2320	K11
2323	E13
2324	L11
2325	F10
2329	B19
2341	E11
2342	L11
2345	G18
2346	G19
2374	F 2
3211	D 3
3215	B 5
3216	B 6
3217	B 7
3218	C 6
3219	D 6
3220	B 6
3221	B 3
3222	C 3
3223	D 8
3224	B 8
3225	B 4
3226	B 4
3227	C 4
3228	C 5
3229	B 7
3230	A 7
3235	C 8
3241	H 3
3243	H 3
3244	M 5
3246	M 5
3247	N 6
3248	L 4
3250	M 6
3251	E 3
3252	F 4
3253	F 5
3254	F 6
3256	F 5
3301	E11
3302	L11
3303	D12
3304	K12
3305	D11
3306	K11
3307	D19
3308	D19
3309	C19
3310	C19
3311	G13
3312	G14
3313	L15
3314	M15
3316	B19
3317	L10
3321	J 6
3326	F19
3327	E19
3328	F11
3333	C18
3335	J17
3336	J17
3337	J17
3338	J17
3340	B17
3341	C16
3342	B18
3343	E11
3344	L11
5301	F13
5302	F14
5303	L15
5304	M15
6221	B 8
6225	D 6
6226	D 4
6228	D 4
6233	D 5
6234	D 7
6235	H 3
6236	M 5
6243	F 1
6244	M 6
6245	K 5
6251	F 4
6252	E 5
6300	D13
6301	E20
6305	F17
6306	F16
6307	F17
6308	F18
6309	B20
6310	C18
6312	C16
6313	L10
6314	B16
6315	L 9
7211	C 4
7221	A 5
7222	B 3
7223	C 7
7224	B 4
7225	D 6
7226	A 5
7227	B 7
7228	D 7
7236	M 5
7237	M 6
7238	L 5
7251	E 3
7301	A15
7302	H15
7303	B16
7304	B17
7305	B18
7315	B19
7316	G10
7322	E17
8233	D13
9281	K17
9282	K17
9283	L17
9285	L17
9286	L17
9287	M17
9288	M17
9289	M17
9290	N17
9300	E13

PARTSLIST POWER4 MODULE



MECHANICAL PARTSLIST POWER4 MODULE

201	4822 426 10607	RUCKSACK not for /21
201	4822 426 10608	RUCKSACK only for /21
215	4822 492 11735	SPRING TRANSISTOR

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS

1200 ⚠	4822 071 51002	FUSE T1A
1201 ⚠	4822 071 51002	FUSE T1A
1201 ⚠	4822 253 50137	FUSE T 2,5A UL
1203 ⚠	4822 071 52502	FUSE T 2,5A
1203 ⚠	4822 252 51121	FUSE T3,15A UL
1204 ⚠	4822 071 52502	FUSE T 2,5A
1204 ⚠	4822 252 51121	FUSE T3,15A UL
1205 ⚠	4822 071 52502	FUSE T 2,5A
1205 ⚠	4822 252 51121	FUSE T3,15A UL
1209 ⚠	4822 265 31015	MAINS SOCKET, IEC
1209 ⚠	4822 265 31016	MAINS SOCKET, UL
1210 ⚠	4822 272 10269	VOLTAGE SELECTOR
1299 ⚠	4822 071 51002	FUSE T1A
1303	4822 267 31176	SPEAKER TERMINAL
1304	4822 265 10912	SPEAKER TERMINAL 4P
1360 ⚠	4822 252 11225	FUSE F3.15A IEC 250V
1360 ⚠	4822 252 11226	FUSE F4A UL/CSA 250V
1361 ⚠	4822 252 11225	FUSE F3.15A IEC 250V
1361 ⚠	4822 252 11226	FUSE F4A UL/CSA 250V

CAPACITORS

2200	4822 124 12328	6800µF	20%	16V
2202	4822 124 80415	4700µF	20%	50V
2204	4822 124 42367	3300µF	20%	35V
2206	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V
2211	5322 121 42386	100nF	5%	63V
2212	5322 121 42386	100nF	5%	63V
2216	4822 126 12882	100nF	20%	50V
2217	4822 126 12882	100nF	20%	50V
2221	4822 124 40248	10µF	20%	63V
2222	4822 124 40433	47µF	20%	25V
2225	4822 126 12882	100nF	20%	50V
2226	4822 124 40433	47µF	20%	25V
2227	4822 124 22652	2,2µF	20%	50V
2236	4822 124 40248	10µF	20%	63V
2251	4822 124 40255	100µF	20%	50V
2253	4822 124 41407	0,47µF	20%	63V
2298	4822 124 21913	1µF	20%	63V
2299	4822 126 12882	100nF	20%	50V
2301	4822 126 11714	4,7nF	20%	16V
2302	4822 126 11714	4,7nF	20%	16V
2303	4822 126 11714	4,7nF	20%	16V
2304	4822 126 11714	4,7nF	20%	16V
2305	4822 124 40207	100µF	20%	25V
2306	4822 124 40207	100µF	20%	25V
2307	4822 124 40207	100µF	20%	25V
2308	4822 124 40207	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 21913	1µF	20%	63V
2314	4822 124 21913	1µF	20%	63V
2317	4822 124 40433	47µF	20%	25V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	16V
2324	4822 126 11714	4,7nF	20%	16V
2325	4822 124 40248	10µF	20%	63V
2329	4822 122 33848	47pF	5%	50V
2341	4822 126 11714	4,7nF	20%	16V
2342	4822 126 11714	4,7nF	20%	16V
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2374	4822 121 43526	47nF	5%	100V

ELECTRICAL PARTSLIST POWER4 MODULE

RESISTORS

3201 ⚠	4822 053 21106	10MΩ	5%	0,5W
3202	4822 050 21003	10kΩ	2%	0,25W
3203	4822 116 83876	270Ω	5%	0.16W
3215	4822 116 52244	15kΩ	5%	0,5W
3216	4822 050 11002	1kΩ	5%	0,2W
3217	4822 050 11002	1kΩ	5%	0,2W
3218	4822 050 21003	10kΩ	2%	0,25W
3219	4822 116 52269	3,3kΩ	5%	0,5W
3220	4822 116 52269	3,3kΩ	5%	0,5W
3221	4822 116 83884	47kΩ	5%	0,16W
3222	4822 050 23303	33kΩ	1%	0,6W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W
3225	4822 116 83876	270Ω	5%	0.16W
3226	4822 050 11002	1kΩ	5%	0,2W
3227	4822 116 52256	2,2kΩ	5%	0,16W
3228	4822 050 11002	1kΩ	5%	0,2W
3229	4822 050 11002	1kΩ	5%	0,2W
3230	4822 116 52269	3,3kΩ	5%	0,5W
3235	4822 116 52199	68Ω	5%	0,16W
3239	4822 116 52283	4,7kΩ	5%	0,5W
3241	4822 116 52249	1,8kΩ	5%	0,16W
3243	4822 116 52249	1,8kΩ	5%	0,16W
3244	4822 116 52257	22kΩ	5%	0,5W
3246	4822 116 83883	470Ω	5%	0,16W
3247	4822 116 52206	120Ω	5%	0,5W
3248	4822 050 21003	10kΩ	2%	0,25W
3250	4822 116 52206	120Ω	5%	0,5W
3251	4822 116 52283	4,7kΩ	5%	0,5W
3252	4822 116 52256	2,2kΩ	5%	0,16W
3253 ⚠	4822 052 10479	47Ω	5%	0,3W
3254 ⚠	4822 052 10479	47Ω	5%	0,3W
3256	4822 116 52257	22kΩ	5%	0,5W
3301	4822 116 83961	6,8kΩ	5%	0,16W
3302	4822 116 83961	6,8kΩ	5%	0,16W
3303	4822 116 83881	390Ω	5%	0,5W
3304	4822 116 83881	390Ω	5%	0,5W
3305	4822 116 52219	330Ω	5%	0,5W
3306	4822 116 52219	330Ω	5%	0,5W
3307	4822 116 52228	680Ω	5%	0,5W
3308	4822 116 52228	680Ω	5%	0,5W
3309	4822 116 52231	820Ω	5%	0,5W
3310	4822 116 52231	820Ω	5%	0,5W
3311	4822 050 24708	4,7Ω	1%	0,6W
3312	4822 050 24708	4,7Ω	1%	0,6W
3313	4822 050 24708	4,7Ω	1%	0,6W
3314	4822 050 24708	4,7Ω	1%	0,6W
3316	4822 116 83883	470Ω	5%	0,16W
3317	4822 116 52249	1,8kΩ	5%	0,16W
3321	4822 116 52276	3,9kΩ	5%	0,5W
3326	4822 116 52283	4,7kΩ	5%	0,5W
3327	4822 116 52219	330Ω	5%	0,5W
3328	4822 050 21003	10kΩ	2%	0,25W
3333	4822 116 83884	47kΩ	5%	0,16W
3335	4822 053 10221	220Ω	5%	1W
3336	4822 053 10221	220Ω	5%	1W
3337	4822 053 10221	220Ω	5%	1W
3338	4822 053 10221	220Ω	5%	1W
3340	4822 116 52219	330Ω	5%	0,5W
3341	4822 116 52283	4,7kΩ	5%	0,5W
3342	4822 116 52269	3,3kΩ	5%	0,5W
3343	4822 116 83872	220Ω	5%	0,5W
3344	4822 116 83872	220Ω	5%	0,5W

COILS

5201	4822 157 11832	400µH
5301	4822 157 62255	COIL 18,5 TURNS
5302	4822 157 62255	COIL 18,5 TURNS
5303	4822 157 62255	COIL 18,5 TURNS
5304	4822 157 62255	COIL 18,5 TURNS

DIODES

6201 ⚠	4822 130 82078	D5SBA20
6204 ⚠	5322 130 80686	1N5392
6205 ⚠	5322 130 80686	1N5392
6206	4822 130 30621	1N4148
6207	4822 130 34278	BZX79-C6V8
6208	4822 130 31878	1N4003G
6221	9331 668 80133	BZX79-B11
6225	4822 130 34382	BZX79-B8V2
6226	4822 130 30621	1N4148
6228	4822 130 30621	1N4148
6233	4822 130 31024	BZX79-C18
6234	4822 130 30621	1N4148
6235	4822 130 30621	1N4148
6236	4822 130 30621	1N4148
6239	4822 130 30621	1N4148
6243	3198 010 58280	BZX79-B8V2
6244	3198 010 53980	BZX79-B3V9
6251	4822 130 34328	BZX79-C30
6252	4822 130 34173	BZX79-B5V6
6253	4822 130 31878	1N4003G
6254	4822 130 31878	1N4003G
6300	4822 130 31878	1N4003G
6301	3198 010 52290	BZX79-B22
6305	4822 130 31878	1N4003G
6306	4822 130 31878	1N4003G
6307	4822 130 31878	1N4003G
6308	4822 130 31878	1N4003G
6309	4822 130 30621	1N4148
6310	4822 130 31981	BZX79-B3V9
6312	4822 130 10871	SBYV27
6313	4822 130 30621	1N4148
6314	9340 550 66112	BYV28-200/24
6315	4822 130 34278	BZX79-C6V8

TRANSISTORS

7202	9332 592 40126	BC368
7221	9322 139 23687	BDX53BFP
7222	4822 130 40959	BC547B
7223	4822 130 40959	BC547B
7224	4822 130 41691	BC556B
7225	4822 130 40959	BC547B
7226	4822 130 41691	BC556B
7227	4822 130 40995	BD438
7228	4822 130 40959	BC547B
7236	4822 130 40959	BC547B
7237	4822 130 40959	BC547B
7238	4822 130 40995	BD438
7251	4822 130 41327	BC327-40
7303	4822 130 11336	STP16NE06FP
7304	4822 130 41691	BC556B
7305	4822 130 10847	BDW94C
7315	4822 130 40959	BC547B
7316	4822 130 40959	BC547B
7322	4822 130 44568	BC557B

INTEGRATED CIRCUITS

7203	4822 209 80817	L7805CV
7301	9322 153 02682	AN7591, POWER STAGE
7302	9322 153 02682	AN7591, POWER STAGE

MPEG-99 BOARD

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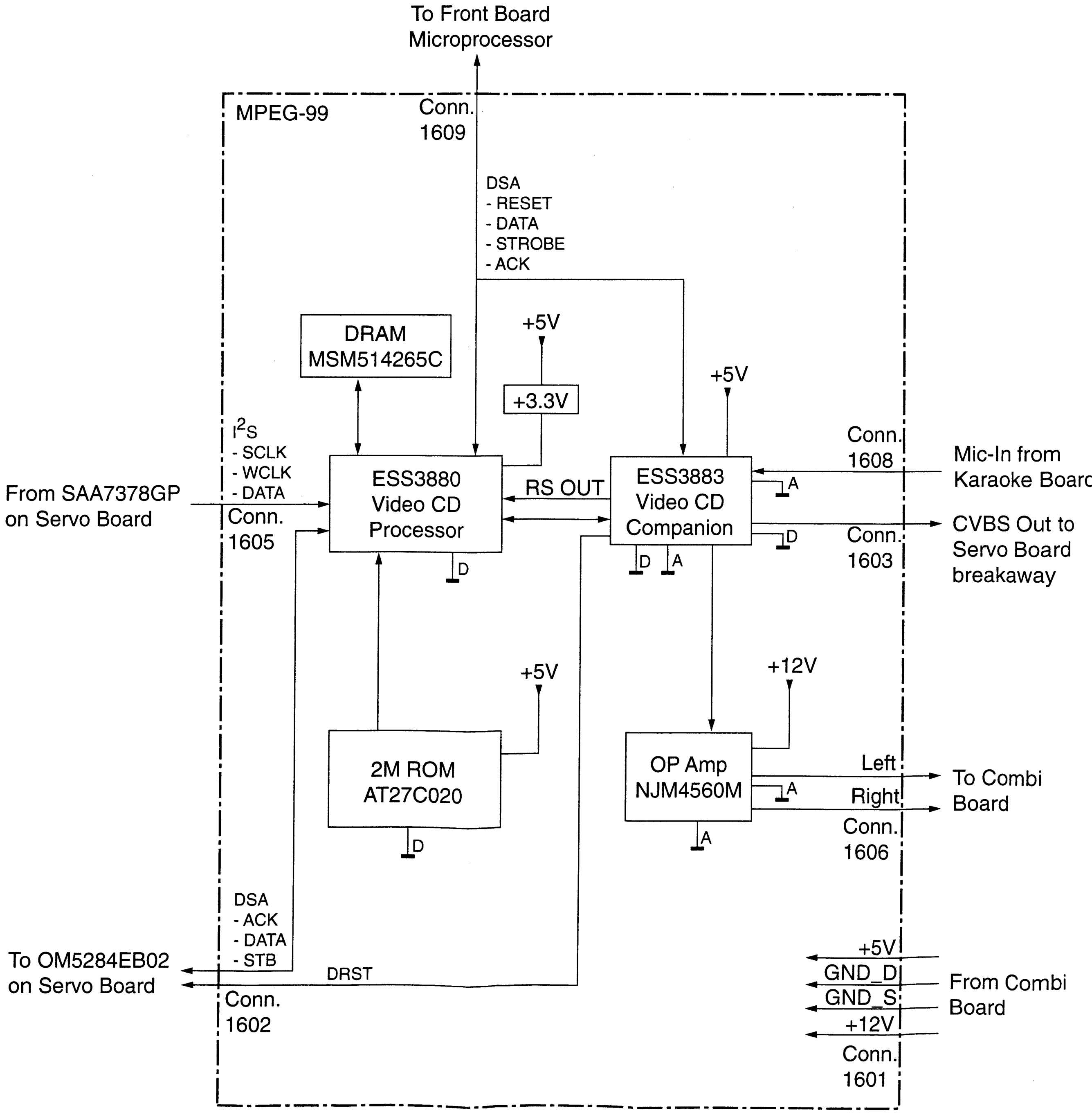
MPEG Board application

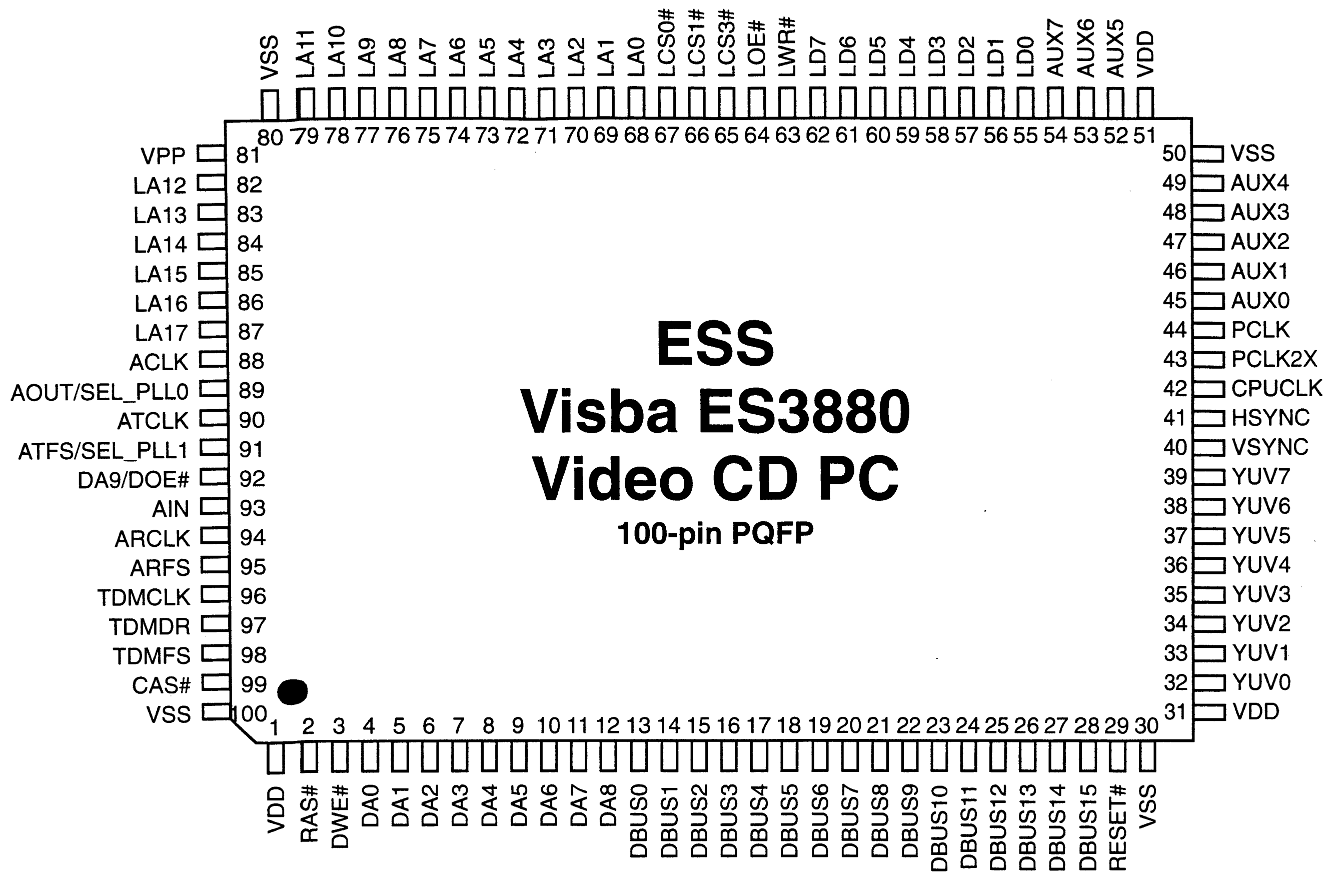
A52510	FW399V/21/21M
A53310	FW548V/21M/21K
A53450	FW-V39/21M/21K, FW-V55/21M/21K, FW-M55/22/37
A53520	FW-V28/21M

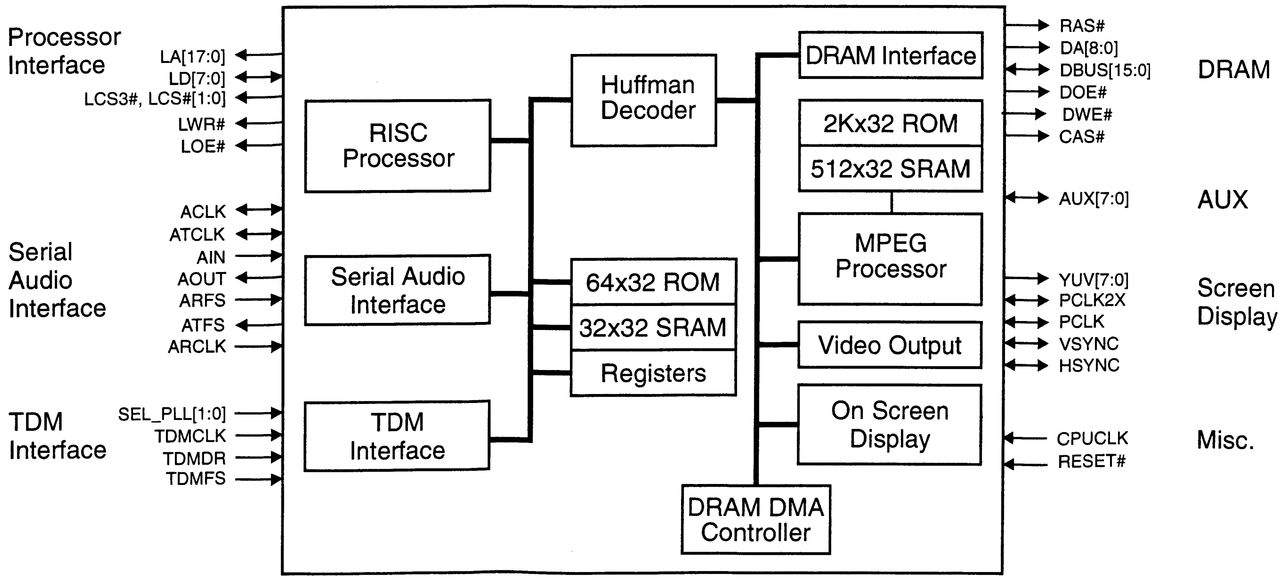
MPEG-99 BLOCK DIAGRAM



To Front Board
Microprocessor
MPEG-99
Conn.
1609
DSA
- RESET
- DATA
- STROBE
- ACK
DRAM
MSM514265C
+5V
+3.3V
+5V
I²S
- SCLK
- WCLK
- DATA
Conn.
1605
From SAA7378GP
on Servo Board
ESS3880
Video CD
Processor
RS OUT
ESS3883
Video CD
Companion
Conn.
1608
Mic-In from
Karaoke Boar
A
D
Conn.
1603
CVBS Out to
Servo Board
breakaway
D
D
A
+5V
+12V
2M ROM
AT27C020
D
OP Amp
NJM4560M
A
A
Left
Right
Conn.
1606
To Combi
Board
DSA
- ACK
- DATA
- STB
To OM5284EB02
on Servo Board
DRST
Conn.
1602
+5V
GND_D
GND_S
+12V
Conn.
1601
From Combi
Board

ES3880 VIDEO CD PROCESSOR CHIP


ESS
Visba ES3880
Video CD PC
100-pin PQFP
80 VSS
79 LA11
78 LA10
77 LA9
76 LA8
75 LA7
74 LA6
73 LA5
72 LA4
71 LA3
70 LA2
69 LA1
68 LA0
67 LCS0#
66 LCS1#
65 LCS3#
64 LOE#
63 LWR#
62 LD7
61 LD6
60 LD5
59 LD4
58 LD3
57 LD2
56 LD1
55 LD0
54 AUX7
53 AUX6
52 AUX5
51 VDD
81 VPP
82 LA12
83 LA13
84 LA14
85 LA15
86 LA16
87 LA17
88 ACLK
89 AOUT/SEL_PLL0
90 ATCLK
91 ATFS/SEL_PLL1
92 DA9/DOE#
93 AIN
94 ARCLK
95 ARFS
96 TDMCLK
97 TDMDR
98 TDMFS
99 CAS#
100 VSS
1 VDD
2 RAS#
3 DWE#
4 DA0
5 DA1
6 DA2
7 DA3
8 DA4
9 DA5
10 DA6
11 DA7
12 DA8
13 DBUS0
14 DBUS1
15 DBUS2
16 DBUS3
17 DBUS4
18 DBUS5
19 DBUS6
20 DBUS7
21 DBUS8
22 DBUS9
23 DBUS10
24 DBUS11
25 DBUS12
26 DBUS13
27 DBUS14
28 DBUS15
29 RESET#
30 VSS
50 VSS
49 AUX4
48 AUX3
47 AUX2
46 AUX1
45 AUX0
44 PCLK
43 PCLK2X
42 CPUCLK
41 HSYNC
40 VSYNC
39 YUV7
38 YUV6
37 YUV5
36 YUV4
35 YUV3
34 YUV2
33 YUV1
32 YUV0
31 VDD

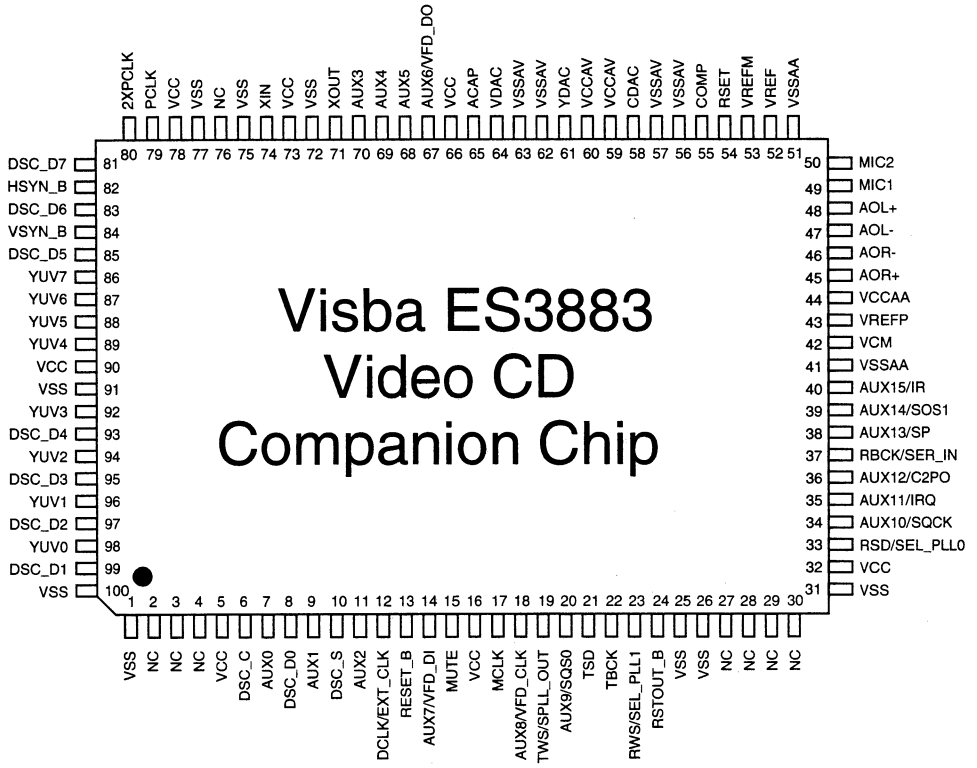

Processor Interface
LA[17:0]
LD[7:0]
LCS3#, LCS#[1:0]
LWR#
LOE#
Serial Audio Interface
ACLK
ATCLK
AIN
AOUT
ARFS
ATFS
ARCLK
TDM Interface
SEL_PLL[1:0]
TDMCLK
TDMDR
TDMFS
RISC Processor
Serial Audio Interface
TDM Interface
Huffman Decoder
64x32 ROM
32x32 SRAM
Registers
DRAM DMA Controller
DRAM Interface
2Kx32 ROM
512x32 SRAM
MPEG Processor
Video Output
On Screen Display
RAS#
DA[8:0]
DBUS[15:0]
DOE#
DWE#
CAS#
DRAM
AUX[7:0]
AUX
YUV[7:0]
PCLK2X
PCLK
VSYNC
HSYNC
Screen Display
CPUCLK
RESET#
Misc.

Visba Video CD PC Block Diagram

VISBA VIDEO PC PROCESSOR CHIP PIN DESCRIPTION

Name	Number	I/O	Definition
VDD	1, 31, 51	I	Voltage supply for 3.3 V.
RAS#	2	O	DRAM row address strobe (active low).
DWE#	3	O	DRAM write enable (active low).
DA[8:0]	12:4	O	DRAM multiplexed row and column address bus.
DBUS[15:0]	28:13	I/O	DRAM data bus.
RESET#	29	I	System reset (active low).
VSS	30, 50, 80, 100	I	Ground.
YUV[7:0]	39:32	O	Y is luminance, UV are chrominance data bus for screen video interface. YUV[7:0] for 8-bit YUV mode.
VSYNC	40	I/O	Vertical sync for screen video interface, programmable for rising or falling edge.
HSYNC	41	I/O	Horizontal sync for screen video interface, programmable for rising or falling edge.
CPUCLK	42	I	RISC and system clock input. CPUCLK is used only if SEL_PLL[1:0] = 00.
PCLK2X	43	I/O	Pixel clock; two times the actual pixel clock for screen video interface.
PCLK	44	I/O	Pixel clock qualifier in for screen video interface.
AUX[7:0]	54, 52, 53, 49:45	I/O	Auxiliary control pins (AUX0 and AUX1 are open collectors).
LD[7:0]	62:55	I/O	RISC interface data bus.
LWR#	63	O	RISC interface write enable (active low).
LOE#	64	O	RISC interface output enable (active low).
LCS[3,1,0]#	65,66,67	O	RISC interface chip select (active low).
LA[17:0]	87:82, 79:68	O	RISC interface address bus.
VPP	81	I	Digital supply voltage for 5 V.
ACLK	88	I/O	Master clock for external audio DAC (8.192 MHz, 11.2896 MHz, 12.288 MHz, 16.9344 MHz, and 18.432 MHz).
AOUT/ SEL_PLL0	89	O	Dual-purpose pin. AOUT is the audio interface serial data output
		I	Pins SEL_PLL[1:0] select phase-lock loop (PLL) clock frequency CPUCLK for the Visba: 00 = bypass PLL. 01 = 54 MHz PLL. 10 = 67.5 MHz PLL. 11 = 81 MHz PLL.
ATCLK	90	I/O	Audio transmit bit clock.
ATFS/ SEL_PLL1	91	O	Dual-purpose pin. ATFS is the audio interface transmit frame sync.
		I	Pins SEL_PLL[1:0] select phase-lock loop (PLL) clock frequency CPUCLK for the Visba. See the SEL_PLL0 pin above for the settings.
DA9/DOE#	92	O	Dual purpose pin: DRAM output enable (active low)/DRAM multiplexed row and column address bus.
AIN	93	I	Audio interface serial data input.
ARCLK	94	I	Audio receive bit clock.
ARFS	95	I	Audio interface receive frame sync.
TDMCLK	96	I	TDM interface serial clock.
TDMDR	97	I	TDM interface serial data receive.
TDMFS	98	I	TDM interface frame sync.
CAS#	99	O	DRAM column address strobe bank 0 (active low).

ES3883 VIDEO CD COMPANION CHIP

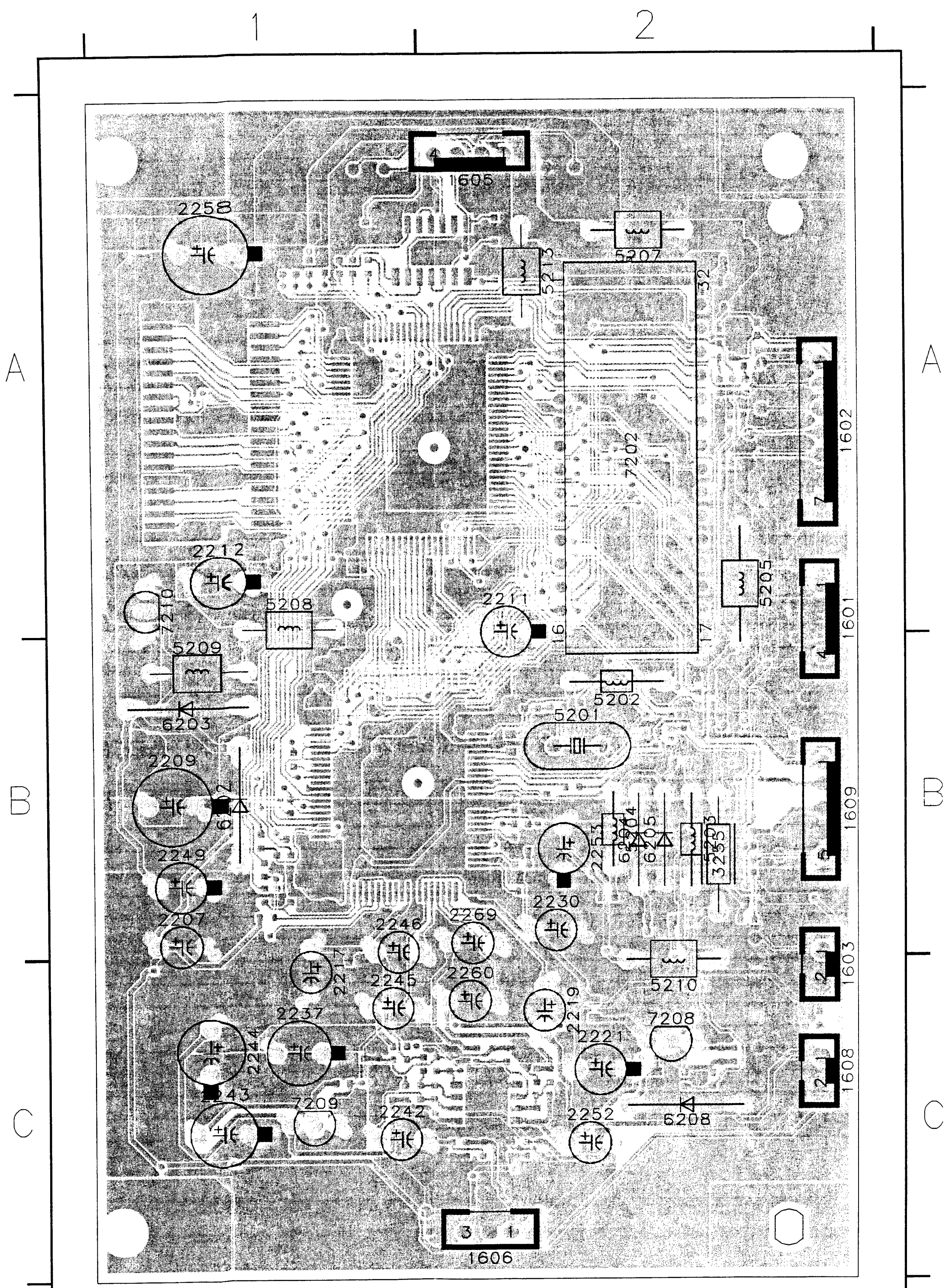

Visba ES3883
Video CD
Companion Chip
2XPCLK
PCLK
VCC
VSS
NC
VSS
XIN
VCC
VSS
XOUT
AUX3
AUX4
AUX5
AUX6/VFD_DO
VCC
ACAP
VDAC
VSSAV
VSSAV
YDAC
VCCAV
VCCAV
CDAC
VSSAV
VSSAV
COMP
RSET
VREFM
VREF
VSSAA
DSC_D7
HSYN_B
DSC_D6
VSYN_B
DSC_D5
YUV7
YUV6
YUV5
YUV4
VCC
VSS
YUV3
DSC_D4
YUV2
DSC_D3
YUV1
DSC_D2
YUV0
DSC_D1
VSS
MIC2
MIC1
AOL+
AOL-
AOR-
AOR+
VCCAA
VREFP
VCM
VSSAA
AUX15/IR
AUX14/SOS1
AUX13/SP
RBCK/SER_IN
AUX12/C2PO
AUX11/IRQ
AUX10/SQCK
RSD/SEL_PLL0
VCC
VSS
VSS
NC
NC
NC
VCC
DSC_C
AUX0
DSC_D0
AUX1
DSC_S
AUX2
DCLK/EXT_CLK
RESET_B
AUX7/VFD_DI
MUTE
VCC
MCLK
AUX8/VFD_CLK
TWS/SPLL_OUT
AUX9/SQS0
TSD
TBCK
RWS/SEL_PLL1
RSTOUT_B
VSS
VSS
NC
NC
NC
NC

PIN DESCRIPTION

Name	Number	I/O	Definition
VSS	1,25:26,31,72,75,77,91,100	I	Ground.
VCC	5,16,32,66,73,78,90	I	Voltage supply, 5 V.
DSC_C	6	I	Clock for programming to access internal registers.
AUX0	7	I/O	Servo Forward or Control Pin.
AUX1	9	I/O	Servo Reverse or Control Pin.
AUX2	11	I/O	Servo LDON or Control Pin.
AUX3	70	I/O	Servo CW/Limit or Control Pin.
AUX4	69	I/O	Servo CCW/Close or Control Pin.
AUX5	68	I/O	Servo Data or Control Pin.
AUX6	67	I/O	Servo XLAT or Control Pin/VFD_DO.
AUX7	14	I/O	Servo BRKM/Sense or Control Pin/VFD_DI.
AUX8	18	I/O	Servo Mute/Open or Control Pin/VFD_CLK.
AUX9	20	I/O	Servo SQS0 or Control Pin.
AUX10	34	I/O	Servo SQCK or Control Pin.
AUX11	35	I/O	3880 IRQ or Interrupt Output or Control Pin.
AUX12	36	I/O	CD C2PO or Interrupt Input or Control Pin.
AUX13	38	I/O	Serial Interrupt/CD-Mute or Control Pin.
AUX14	39	I/O	Servo SCOR (S0S1) or Interrupt Input or Control Pin.
AUX15	40	I/O	Interrupt Input or Control Pin.
DSC_D[7:0]	81,83,85,93,95,97,99,8	I/O	Data for programming to access internal registers.
DSC_S	10	I	Strobe for programming to access internal registers.
DCLK	12	O	Dual-purpose pin DCLK is the MPEG decoder clock.
EXT_CLK		I	EXT_CLK is the external clock EXT_CLK is an input during bypass PLL mode.
RESET_B	13	I	Video reset (active-low).
MUTE	15	O	Audio mute.
MCLK	17	I	Audio master clock.
TWS	19	I	Dual-purpose pin TWS is the transmit audio frame sync.
SPLL_OUT		O	SPLL_OUT is the select PLL output.

Name	Number	I/O	Definition
TSD	21	I	Transmit audio data input.
TBCK	22	I	Transmit audio bit clock.
RWS	23	O	Dual-purpose pin RWS is the receive audio frame sync.
SEL_PLL1		I	Pins SEL_PLL[1:0] select the PLL clock frequency for the DCLK output. SEL_PLL1 SEL_PLL0 DCLK 0 0 Bypass PLL (input mode) 0 1 27 MHz (output mode) 1 0 32.4 MHz (output mode) 1 1 40.5 MHz (output mode)
RSTOUT_B	24	O	Reset output (active-low).
NC	2:4,27:30,76		No connect. Do not connect to these pins.
RSD	33	O	Dual-purpose pin. RSD is the receive audio data input.
SEL_PLL0		I	SEL_PLL0 along with SEL_PLL1 select the PLL clock frequency for the DCLK output. See the table for pin number 23.
RBCK	37	O	Dual-purpose pin. RBCK is the receive audio bit clock.
SER_IN		I	SER_IN is the serial input DSC mode. 0 - Parallel DSC mode. 1 - Serial DSC mode.
VSSAA	41,51	I	Audio Analog Ground.
VCM	42	I	ADC Common Mode Reference (CMR) buffer output. CMR is approximately 2.25 V. Bypass to analog ground with 47 mF electrolytic in parallel with 0.1 mF.
VREFP	43	I	DAC and ADC maximum reference. Bypass to VCMR with 10 mF in parallel with 0.1 mF.
VCCAA	44	I	Analog VCC, 5 V.
AOR+, AOR-	45:46	O	Right channel output.
AOL-, AOL+	47:48	O	Left channel output.
MIC1	49	I	Microphone input 1.
MIC2	50	I	Microphone input 2.
VREF	52	I	Internal resistor divider generates Common Mode Reference (CMR) voltage. Bypass to analog ground with 0.1 mF.
VREFM	53	I	DAC and ADC minimum reference. Bypass to VCMR with 10 mF in parallel with 0.1 mF.
RSET	54	I	Full scale DAC current adjustment.
COMP	55	I	Compensation pin.
VSSAV	56:57,62:63	I	Video Analog Ground
CDAC	58	O	Modulated chrominance output.
VCCAV	59,60	I	Video VCC, 5 V
YDAC	61	O	Y luminance data bus for screen video port.
VDAC	64	O	Composite video output.
ACAP	65	I	Audio CAP
XOUT	71	O	Crystal output.
XIN	74	I	27 MHz crystal input.
PCLK	79	I/O	13.5 MHz pixel clock.
2XPCLK	80	I/O	27 MHz (2 times pixel clock).
HSYN_B	82	O	Horizontal sync (active-low).
VSYN_B	84	O	Vertical sync (active-low).
YUV[7:0]	86:89,92,94,96,98	I	YUV data bus for screen video port.

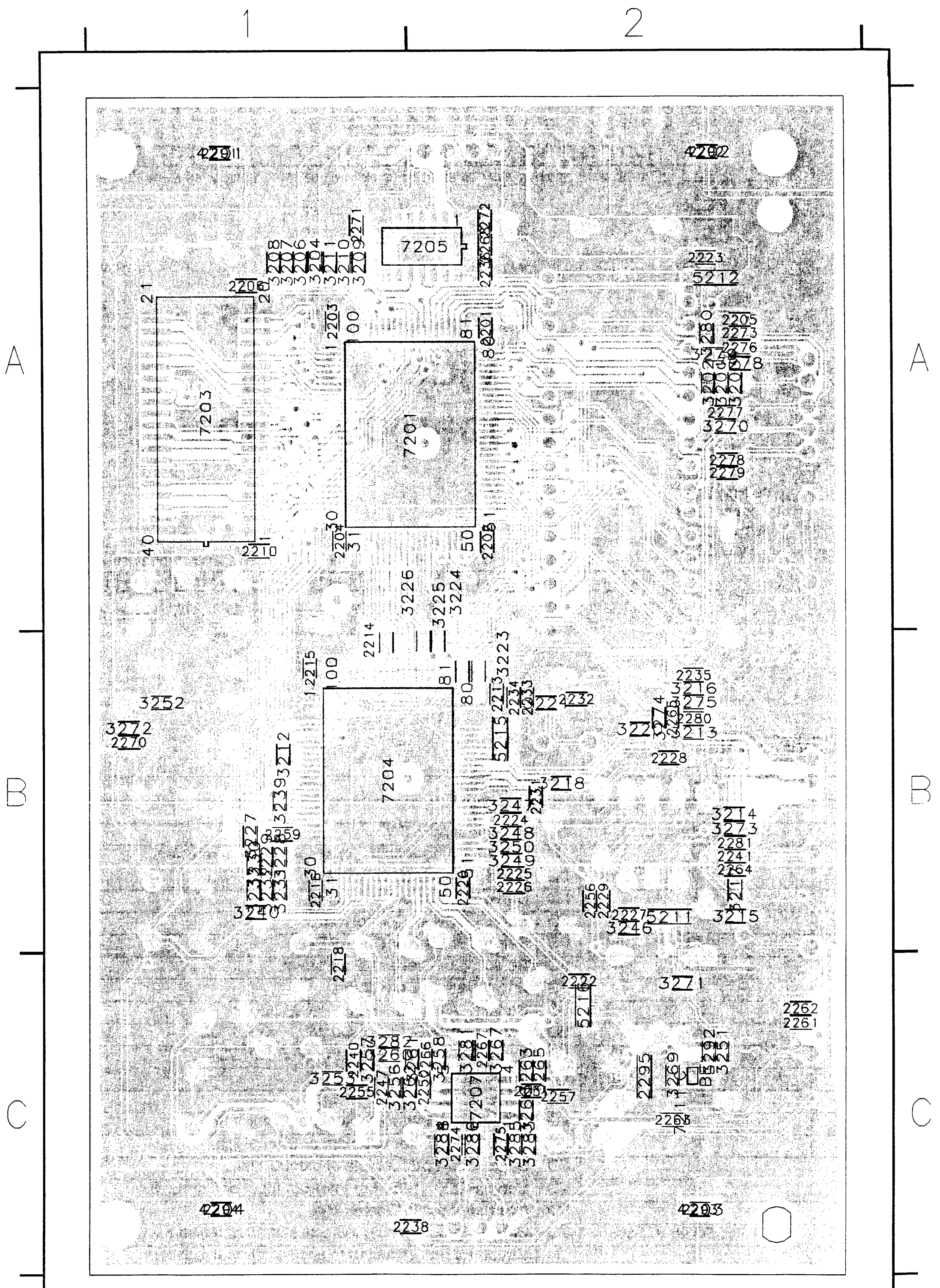
MPEG-99 BOARD LAYOUT


1
2
A
B
C
1605
1606
1601
1602
1603
1608
1609
2258
2212
2211
2209
2249
2207
2246
2269
2245
2260
2230
2219
2221
2237
2244
2243
2242
2252
2253
5207
5213
5205
5208
5209
5202
5201
5210
6203
6208
7202
7208
7209
7210

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3407 pt 3 dd wk013

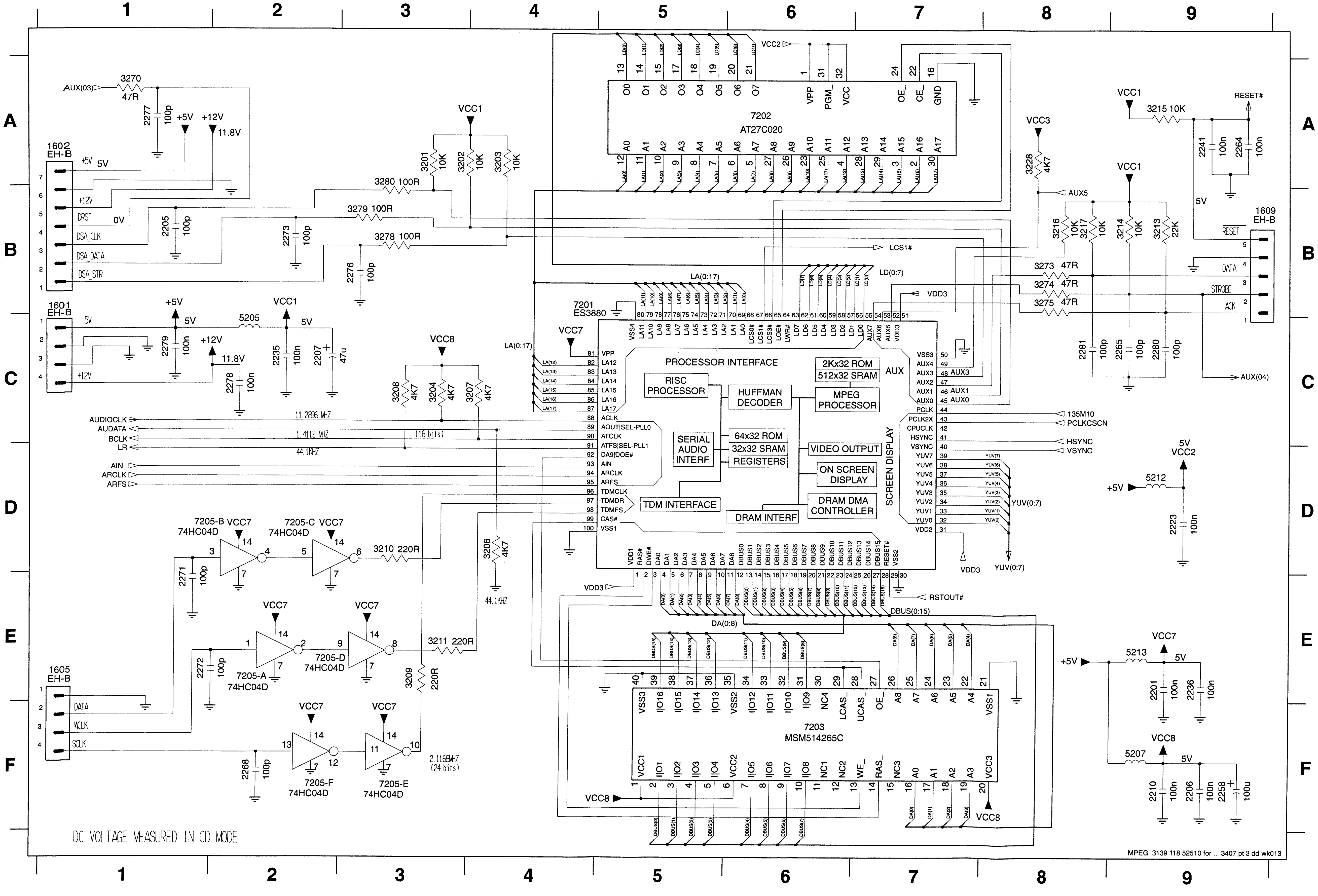
1601	A2
1602	A2
1603	C2
1605	A2
1606	C2
1608	C2
1609	B2
2201	A2
2202	A2
2203	A1
2204	A1
2205	A2
2206	A1
2207	C1
2209	B1
2210	A1
2211	A2
2212	A1
2213	B2
2214	A1
2215	B1
2216	B1
2217	C1
2218	C1
2219	C2
2220	B2
2221	C2
2222	C2
2223	A2
2224	B2
2225	B2
2226	B2
2227	B2
2228	B2
2229	B2
2230	C2
2231	B2
2232	B2
2233	B2
2234	B2
2235	B2
2236	A2
2237	C1
2238	C1
2240	C1
2241	B2
2242	C1
2243	C1
2244	C1
2245	C1
2246	B1
2247	C1
2249	B1
2250	C2
2251	C2
2252	C2
2253	B2
2255	C1
2256	B2
2257	C2
2258	A1
2259	B1
2260	C2
2261	C2
2262	C2
2263	C2
2264	B2
2265	B2
2266	C2
2267	C2
2268	A2
2269	B2
2270	B1
2271	A1
2272	A2
2273	A2
2274	C2
2275	C2
2276	A2
2277	A2
2278	A2
2279	A2
2280	B2
2281	B2
2291	A1
2292	A2
2293	C2
2294	C1
2295	C2
3201	A2
3202	A2
3203	A2
3204	A1
3206	A1
3207	A1
3208	A1
3209	A1
3210	A1
3211	A1
3212	B1
3213	B2
3214	B2
3215	B2
3216	B2
3217	B2
3218	B2
3220	B2
3221	B2
3223	B2
3224	B2
3225	A2
3226	B2
3227	B1
3228	B1
3229	B1
3230	B1
3231	B1
3232	B1
3233	B1
3239	B1
3240	B1
3246	B2
3247	B2
3248	B2
3249	B2
3250	B2
3251	C2
3252	B1
3253	C1
3255	B2
3256	C1
3257	C1
3258	C2
3260	C1
3261	C2
3262	C1
3263	C2
3265	C2
3266	C2
3267	C2
3269	C2
3270	A2
3271	B2
3272	B1
3273	B2
3274	B2
3275	B2
3278	A2
3279	A2
3280	A2
3281	C2
3282	C1
3283	C2
3284	C2
3285	C2
3286	C2
3292	C2
4201	A1
4202	A2
4203	C2
4204	C1
5201	B2
5202	B2
5203	B2
5204	B2
5205	A2
5207	A2
5208	A1
5209	B1
5210	C2
5211	B2
5212	A2
5213	A2
5215	B2
5216	C2
6202	B1
6203	B1
6204	B2
6205	B2
6208	C2
7201	A2
7202	A2
7203	A1
7204	B1
7205	A2
7207	C2
7208	C2
7209	C1
7210	A1
7211	C2


1
2
A
B
C
7201
7203
7204
7205
7207
5211
5212
5215
3226
3225
3224
3252
3272
3271
2270
2210
2228
2235
2295
2238
4201
4202
4203
4204

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

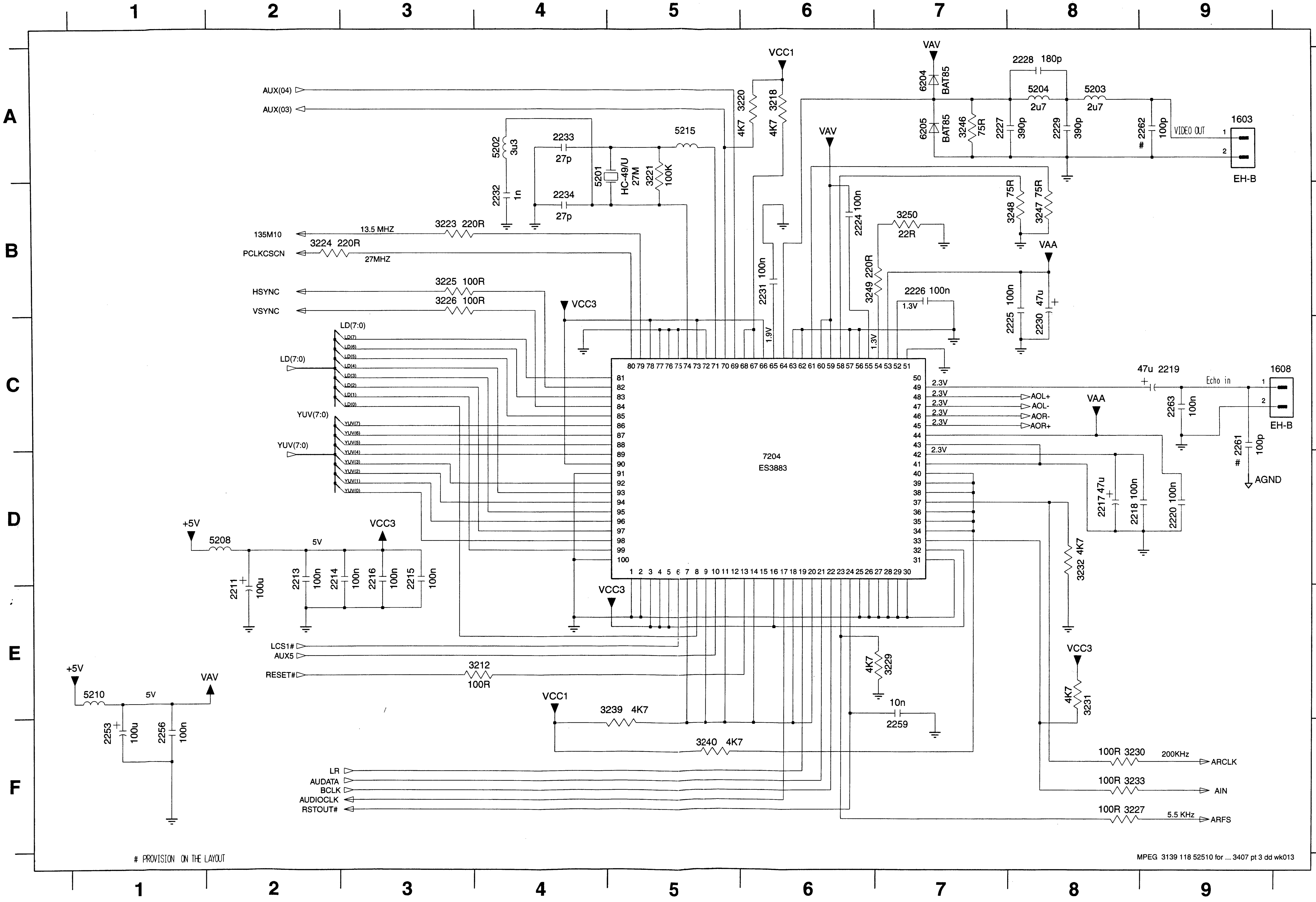
3139 113 3407 pt 3 dd wk013

ES3880 CIRCUIT


1 2 3 4 5 6 7 8 9
A B C D E F
7202
AT27C020
7201
ES3880
7203
MSM514265C
PROCESSOR INTERFACE
RISC PROCESSOR
HUFFMAN DECODER
2Kx32 ROM
512x32 SRAM
MPEG PROCESSOR
AUX
SERIAL AUDIO INTERF
64x32 ROM
32x32 SRAM
REGISTERS
VIDEO OUTPUT
ON SCREEN DISPLAY
SCREEN DISPLAY
TDM INTERFACE
DRAM DMA CONTROLLER
DRAM INTERF
1602 EH-B
1601 EH-B
1605 EH-B
1609 EH-B
+5V 5V
+12V 11.8V
DRST 0V
DSA_CLK
DSA_DATA
DSA_STR
DATA
WCLK
SCLK
RESET
STROBE
ACK
AUX(03)
AUX(04)
AUX5
LCS1#
LA(0:17)
LD(0:7)
VDD3
RESET#
135M10
PCLKCSCN
HSYNC
VSYNC
YUV(0:7)
RSTOUT#
DA(0:8)
DBUS(0:15)
AUDIOCLK
AUDATA
BCLK
LR
AIN
ARCLK
ARFS
11.2896 MHZ
1.4112 MHZ
44.1KHZ
(16 bits)
2.1168MHZ
(24 bits)
VCC1
VCC2
VCC3
VCC7
VCC8
7205-A 74HC04D
7205-B 74HC04D
7205-C 74HC04D
7205-D 74HC04D
7205-E 74HC04D
7205-F 74HC04D
3270 47R
3280 100R
3279 100R
3278 100R
3201 10K
3202 10K
3203 10K
3208 4K7
3204 4K7
3207 4K7
3206 4K7
3210 220R
3211 220R
3209 220R
3228 4K7
3215 10K
3216 10K
3217 10K
3214 10K
3213 22K
3273 47R
3274 47R
3275 47R
5205
5212
5213
5207
DC VOLTAGE MEASURED IN CD MODE
MPEG 3139 118 52510 for ... 3407 pt 3 dd wk013

1601	B1
1602	A1
1605	E1
1609	B9
2201	E9
2205	B1
2206	F9
2207	C2
2210	F9
2223	D9
2235	C2
2236	E9
2241	A9
2258	F9
2264	A9
2265	C9
2268	F2
2271	E1
2272	E1
2273	B2
2276	B3
2277	A1
2278	C2
2279	C1
2280	C9
2281	C8
3201	A3
3202	A3
3203	A4
3204	C3
3206	D4
3207	C4
3208	C3
3209	E3
3210	D3
3211	E3
3213	B9
3214	B9
3215	A9
3216	B8
3217	B8
3228	A8
3270	A1
3273	B8
3274	B8
3275	B8
3278	B3
3279	B3
3280	A3
5205	C2
5207	F9
5212	D9
5213	E9
7201	B4
7202	A6
7203	F6
7205-A	E2
7205-B	D1
7205-C	D2
7205-D	E2
7205-E	F3
7205-F	F2

ES3883 CIRCUIT


1
2
3
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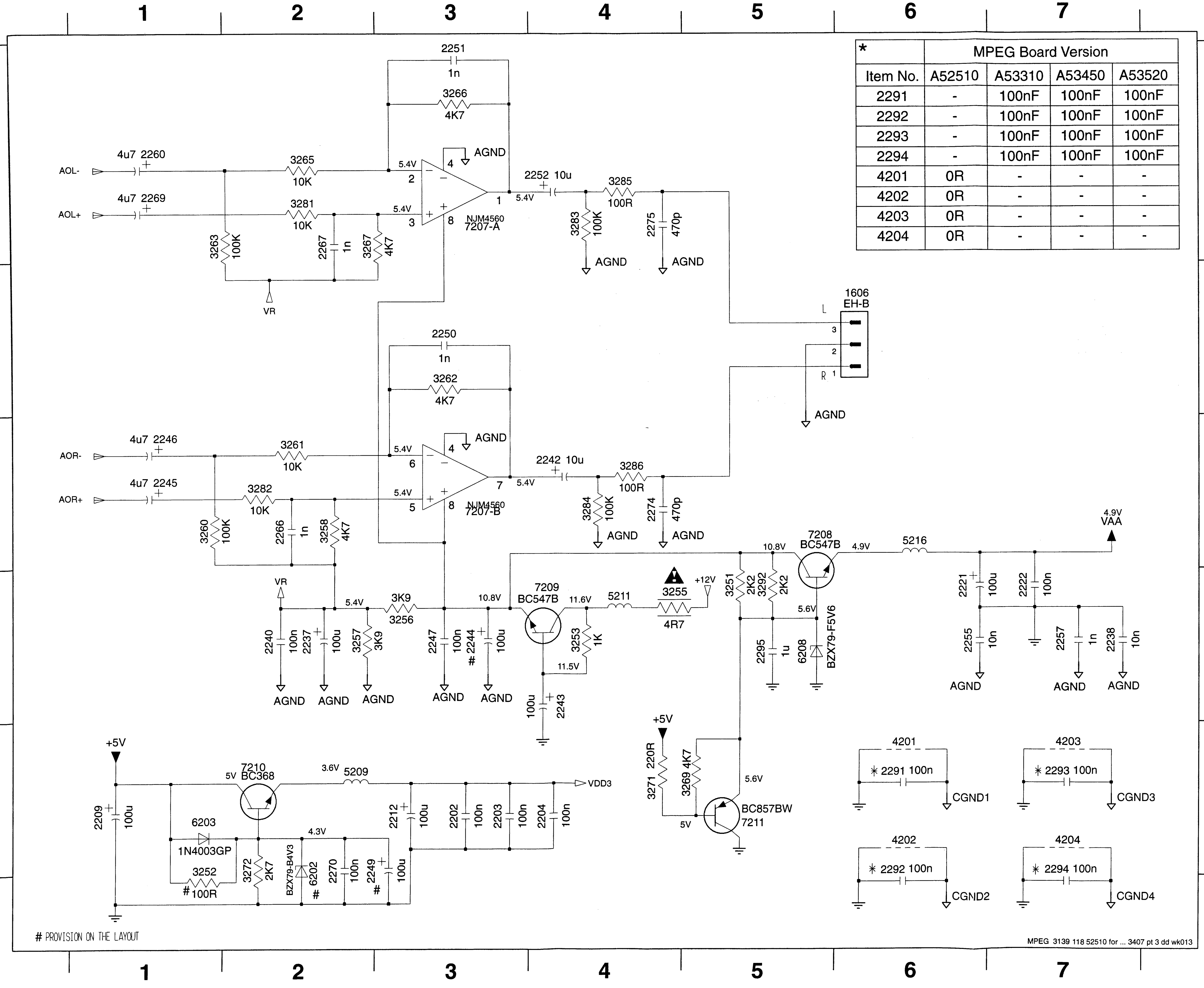
5
6
7
8
9
A
B
C
D
E
F
VCC1
VAV
VAA
VCC3
+5V
AGND
AUX(04)
AUX(03)
135M10
PCLKCSCN
13.5 MHZ
27MHZ
HSYNC
VSYNC
LD(7:0)
YUV(7:0)
LCS1#
AUX5
RESET#
LR
AUDATA
BCLK
AUDIOCLK
RSTOUT#
AOL+
AOL-
AOR-
AOR+
ARCLK
AIN
ARFS
200KHz
5.5 KHz
VIDEO OUT
Echo in
1603
1608
EH-B
7204
ES3883
5202 3u3
2232 1n
2233 27p
2234 27p
5201 HC-49/U 27M
3221 100K
5215
3220 4K7
3218 4K7
3223 220R
3224 220R
3225 100R
3226 100R
2231 100n
2224 100n
3250 22R
3249 220R
2226 100n
2225 100n
2230 47u
6204 BAT85
6205 BAT85
3246 75R
2227 390p
2229 390p
2228 180p
5204 2u7
5203 2u7
2262 100p
3248 75R
3247 75R
2219 47u
2263 100n
2261 100p
2217 47u
2218 100n
2220 100n
3232 4K7
3229 4K7
2259 10n
3231 4K7
3239 4K7
3240 4K7
3212 100R
3230 100R
3233 100R
3227 100R
5208
2211 100u
2213 100n
2214 100n
2216 100n
2215 100n
5210
2253 100u
2256 100n
5V
1.9V
1.3V
2.3V
# PROVISION ON THE LAYOUT
MPEG 3139 118 52510 for ... 3407 pt 3 dd wk013

1603	A9
1608	C9
2211	E2
2213	D2
2214	D2
2215	D3
2216	D3
2217	D8
2218	D8
2219	C9
2220	D9
2224	B6
2225	C7
2226	B7
2227	A7
2228	A8
2229	A8
2230	C8
2231	B6
2232	B4
2233	A4
2234	B4
2253	F1
2256	F1
2259	F7
2261	C9
2262	A9
2263	C9
3212	E4
3218	A6
3220	A5
3221	A5
3223	B3
3224	B2
3225	B3
3226	B3
3227	F8
3229	E7
3230	F8
3231	E8
3232	D8
3233	F8
3239	E5
3240	F5
3246	A7
3247	B8
3248	B8
3249	B6
3250	B7
5201	A4
5202	A4
5203	A8
5204	A8
5208	D2
5210	E1
5215	A5
6204	A7
6205	A7
7204	D6

AUDIO CIRCUIT


1
2
3
4
5
6
7
A
B
C
D
E
AOL-
AOL+
4u7 2260
4u7 2269
3265 10K
3281 10K
3263 100K
2267 1n
3267 4K7
VR
2251 1n
3266 4K7
AGND
5.4V
NJM4560
7207-A
2252 10u
3285 100R
3283 100K
2275 470p
1606
EH-B
L
R
AOR-
AOR+
4u7 2246
4u7 2245
3261 10K
3282 10K
3260 100K
2266 1n
3258 4K7
2250 1n
3262 4K7
NJM4560
7207-B
2242 10u
3286 100R
3284 100K
2274 470p
3K9 3256
2240 100n
2237 100u
3257 3K9
2247 100n
2244 100u
10.8V
7209 BC547B
11.6V
11.5V
5211
3255 4R7
+12V
3253 1K
2243 100u
3251 2K2
3292 2K2
7208 BC547B
4.9V
5216
4.9V VAA
5.6V
2295 1u
6208 BZX79-F5V6
2221 100u
2222 100n
2255 10n
2257 1n
2238 10n
+5V
3271 220R
3269 4K7
5.6V
5V
BC857BW 7211
2209 100u
7210 BC368
5V
3.6V 5209
VDD3
6203 1N4003GP
3252 # 100R
3272 2K7
4.3V
BZX79-B4V3 6202 #
2270 100n
2249 # 100u
2212 100u
2202 100n
2203 100n
2204 100n
4201
✳ 2291 100n
CGND1
4202
✳ 2292 100n
CGND2
4203
✳ 2293 100n
CGND3
4204
✳ 2294 100n
CGND4
# PROVISION ON THE LAYOUT
MPEG 3139 118 52510 for ... 3407 pt 3 dd wk013

*	MPEG Board Version			
Item No.	A52510	A53310	A53450	A53520
2291	-	100nF	100nF	100nF
2292	-	100nF	100nF	100nF
2293	-	100nF	100nF	100nF
2294	-	100nF	100nF	100nF
4201	0R	-	-	-
4202	0R	-	-	-
4203	0R	-	-	-
4204	0R	-	-	-

1606	B6
2202	E3
2203	E3
2204	E4
2209	E1
2212	E3
2221	D6
2222	D7
2237	D2
2238	D7
2240	D2
2242	C4
2243	D4
2244	D3
2245	C1
2246	C1
2247	D3
2249	E2
2250	B3
2251	A3
2252	A4
2255	D6
2257	D7
2260	A1
2266	C2
2267	A2
2269	A1
2270	E2
2274	C4
2275	A4
2291	E6
2292	E6
2293	E7
2294	E7
2295	D5
3251	D5
3252	E1
3253	D4
3255	D4
3256	D3
3257	D2
3258	C2
3260	C1
3261	C2
3262	B3
3263	A1
3265	A2
3266	A3
3267	A2
3269	E5
3271	E4
3272	E2
3281	A2
3282	C2
3283	A4
3284	C4
3285	A4
3286	C4
3292	D5
4201	E6
4202	E6
4203	E7
4204	E7
5209	E2
5211	D4
5216	C6
6202	E2
6203	E1
6208	D5
7207-A	A3
7207-B	C3
7208	C5
7209	D4
7210	E2
7211	E5

ELECTRICAL PARTS LIST - MPEG-99 BOARD

MISCELLANEOUS

1106	3139 118 77760	MPEG Board Assembly

CAPACITORS

2201	4822 126 14305	100nF 10% 16V
2202	4822 126 14305	100nF 10% 16V
2203	4822 126 14305	100nF 10% 16V
2204	4822 126 14305	100nF 10% 16V
2205	4822 122 31765	100pF 2% 63V
2206	4822 126 14305	100nF 10% 16V
2207	4822 124 80483	47µF 20% 6,3V
2209	2020 012 93583	100µF 20% 25V
2210	4822 126 14305	100nF 10% 16V
2211	4822 124 42234	100µF 20% 6,3V
2212	4822 124 42234	100µF 20% 6,3V
2213	4822 126 14305	100nF 10% 16V
2214	4822 126 14305	100nF 10% 16V
2215	4822 126 14305	100nF 10% 16V
2216	4822 126 14305	100nF 10% 16V
2217	4822 124 80483	47µF 20% 6,3V
2218	4822 126 14305	100nF 10% 16V
2219	4822 124 80483	47µF 20% 6,3V
2220	4822 126 14305	100nF 10% 16V
2221	4822 124 42234	100µF 20% 6,3V
2222	4822 126 14305	100nF 10% 16V
2223	4822 126 14305	100nF 10% 16V
2224	4822 126 14305	100nF 10% 16V
2225	4822 126 14305	100nF 10% 16V
2226	4822 126 14305	100nF 10% 16V
2227	4822 126 14315	390pF 5% 50V
2228	4822 126 14508	180pF 5% 50V
2229	4822 126 14315	390pF 5% 50V
2230	4822 124 80483	47µF 20% 6,3V
2231	4822 126 14305	100nF 10% 16V
2232	3198 016 31020	1nF 5% 25V
2233	4822 126 11669	27pF 5% 50V
2234	4822 126 11669	27pF 5% 50V
2235	4822 126 14305	100nF 10% 16V
2236	4822 126 14305	100nF 10% 16V
2237	4822 124 23052	100µF 20% 16V
2238	5322 126 11583	10nF 10% 50V
2240	4822 126 14305	100nF 10% 16V
2241	4822 126 14305	100nF 10% 16V
2242	4822 124 21732	10µF 20% 25V
2243	4822 124 23052	100µF 20% 16V
2245	4822 124 40769	4,7µF 20% 100V
2246	4822 124 40769	4,7µF 20% 100V
2247	4822 126 14305	100nF 10% 16V
2250	3198 016 31020	1nF 5% 25V
2251	3198 016 31020	1nF 5% 25V
2252	4822 124 21732	10µF 20% 25V
2253	4822 124 42234	100µF 20% 6,3V
2255	5322 126 11583	10nF 10% 50V
2256	4822 126 14305	100nF 10% 16V
2257	3198 016 31020	1nF 5% 25V
2258	2020 012 93583	100µF 20% 25V
2259	5322 126 11583	10nF 10% 50V
2260	4822 124 40769	4,7µF 20% 100V
2263	4822 126 14305	100nF 10% 16V
2264	4822 126 14305	100nF 10% 16V
2265	4822 122 31765	100pF 2% 63V
2266	3198 016 31020	1nF 5% 25V
2267	3198 016 31020	1nF 5% 25V
2268	4822 122 31765	100pF 2% 63V
2269	4822 124 40769	4,7µF 20% 100V
2270	4822 126 14305	100nF 10% 16V
2271	4822 122 31765	100pF 2% 63V
2272	4822 122 31765	100pF 2% 63V
2273	4822 122 31765	100pF 2% 63V
2274	4822 126 13881	470pF 5% 50V
2275	4822 126 13881	470pF 5% 50V
2276	4822 122 31765	100pF 2% 63V
2277	4822 122 31765	100pF 2% 63V
2278	4822 126 14305	100nF 10% 16V
2279	4822 126 14305	100nF 10% 16V
2280	4822 122 31765	100pF 2% 63V
2281	4822 122 31765	100pF 2% 63V
2291	4822 126 14305	100nF 10% 16V
2292	4822 126 14305	100nF 10% 16V
2293	4822 126 14305	100nF 10% 16V
2294	4822 126 14305	100nF 10% 16V
2295	3198 017 41050	1µF +80/-20% 10V

RESISTORS

3201	4822 051 30103	10k 5% 0,062W
3202	4822 051 30103	10k 5% 0,062W
3203	4822 051 30103	10k 5% 0,062W
3204	4822 051 30472	4k7 5% 0,062W
3206	4822 051 30472	4k7 5% 0,062W
3207	4822 051 30472	4k7 5% 0,062W
3208	4822 051 30472	4k7 5% 0,062W
3209	4822 051 30221	220R 5% 0,062W
3210	4822 051 30221	220R 5% 0,062W
3211	4822 051 30221	220R 5% 0,062W
3212	4822 051 30101	100R 5% 0,062W
3213	4822 051 30223	22k 5% 0,062W
3214	4822 051 30103	10k 5% 0,062W
3215	4822 051 30103	10k 5% 0,062W
3216	4822 051 30103	10k 5% 0,062W
3217	4822 051 30103	10k 5% 0,062W
3218	4822 051 30472	4k7 5% 0,062W
3220	4822 051 30472	4k7 5% 0,062W
3221	4822 117 13632	100k 1% 0.62W
3223	4822 051 30221	220R 5% 0,062W
3224	4822 051 30221	220R 5% 0,062W

ELECTRICAL PARTS LIST - MPEG-99 BOARD

3225	4822 051 30101	100R 5% 0,062W
3226	4822 051 30101	100R 5% 0,062W
3227	4822 051 30101	100R 5% 0,062W
3228	4822 051 30472	4k7 5% 0,062W
3229	4822 051 30472	4k7 5% 0,062W
3230	4822 051 30101	100R 5% 0,062W
3231	4822 051 30472	4k7 5% 0,062W
3232	4822 051 30472	4k7 5% 0,062W
3233	4822 051 30101	100R 5% 0,062W
3239	4822 051 30472	4k7 5% 0,062W
3240	4822 051 30472	4k7 5% 0,062W
3246	4822 051 30759	75R 5% 0,062W
3247	4822 051 30759	75R 5% 0,062W
3248	4822 051 30759	75R 5% 0,062W
3249	4822 051 30221	220R 5% 0,062W
3250	4822 117 12139	22R 5% 0,062W
3251	4822 051 30222	2k2 5% 0,062W
3253	4822 051 30102	1k 5% 0,062W
3255	4822 052 10478 ⚠	4R7 5% 0,33W
3256	4822 051 30392	3k9 5% 0.063W
3257	4822 051 30392	3k9 5% 0.063W
3258	4822 051 30472	4k7 5% 0,062W
3260	4822 117 13632	100k 1% 0.62W
3261	4822 051 30103	10k 5% 0,062W
3262	4822 051 30472	4k7 5% 0,062W
3263	4822 117 13632	100k 1% 0.62W
3265	4822 051 30103	10k 5% 0,062W
3266	4822 051 30472	4k7 5% 0,062W
3267	4822 051 30472	4k7 5% 0,062W
3269	4822 051 30472	4k7 5% 0,062W
3270	4822 051 30479	47R 5% 0,062W
3271	4822 051 30221	220R 5% 0,062W
3272	4822 051 30272	2k7 5% 0,062W
3273	4822 051 30479	47R 5% 0,062W
3274	4822 051 30479	47R 5% 0,062W
3275	4822 051 30479	47R 5% 0,062W
3278	4822 051 30101	100R 5% 0,062W
3279	4822 051 30101	100R 5% 0,062W
3280	4822 051 30101	100R 5% 0,062W
3281	4822 051 30103	10k 5% 0,062W
3282	4822 051 30103	10k 5% 0,062W
3283	4822 117 13632	100k 1% 0.62W
3284	4822 117 13632	100k 1% 0.62W
3285	4822 051 30101	100R 5% 0,062W
3286	4822 051 30101	100R 5% 0,062W
3292	4822 051 30222	2k2 5% 0,062W

COILS & FILTERS

5201	4822 242 81246	X'tal Resonator 27MHz
5202	4822 157 11813	Coil 3,3µH 5%
5203	4822 157 11868	Coil 2,7µH 5%
5204	4822 157 11868	Coil 2,7µH 5%
5205	4822 526 10704	FE Bead 100MHz
5207	4822 526 10704	FE Bead 100MHz
5208	4822 526 10704	FE Bead 100MHz
5209	4822 526 10704	FE Bead 100MHz
5210	4822 526 10704	FE Bead 100MHz
5211	4822 157 11506	Coil 100MHz
5212	4822 157 11506	Coil 100MHz
5213	4822 526 10704	FE Bead 100MHz
5215	4822 157 11506	Coil 100MHz
5216	4822 157 11506	Coil 100MHz

DIODES

6203	4822 130 31878	1N4003G
6204	4822 130 31983	BAT85
6205	4822 130 31983	BAT85
6208	4822 130 34173	BZX79-B5V6

TRANSISTORS & INTEGRATED CIRCUITS

7201	9322 139 79671	Video Processor ES3880
7202	9965 000 05010	AT27C020-12PC-MP3 Ver_05
7203	9322 142 48668	MSM514265C-60JS
7204	9322 138 97671	Video CD Companion ES3883
7205	5322 209 11517	PC74HCU04T
7207	4822 209 83357	NJM4560M
7208	4822 130 40959	BC547B
7209	4822 130 40959	BC547B
7210	9332 592 40126	BC368
7211	5322 130 42756	BC857BW

Note: Only the parts mentioned in this list are normal service spare parts.

AF6 BOARD

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Dolby Prologic (DPL) Circuit Diagram 13-5
Electrical parts list... 13-6

BRIEF INTRODUCTION OF THE AF6 BOARD

The AF6 Board consists of the following features :

a. SOFAC IC

SOFAC IC TEA6321 (7511) which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C Bus from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX.
It also has a MONO input which is tied to ground via a capacitor. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input source is undesirable.
Note that the input to the SOFAC IC must be ac coupled to prevent 'plop' noise.
Input networks are included to provide appropriate attenuation for various sources.

b. KARAOKE MIC. MIXING

The AF6 Board has provisions which can be configured to cater for one of the following:
NK : Non-Karaoke.
SK : Simple Karaoke which caters for single mic. mixing with additional mic. amplifier board.
FK : Full Karaoke which caters for double mic. mixing with additional mic. amplifier board.

c. DOLBY PRO LOGIC (DPL) INTERFACE

The AF6 Board has provisions which can be configured to cater for Dolby Pro Logic (DPL).

d. LINE OUT

Line out with cinch socket for connection to external amplifier.

e. SUB-WOOFER OUT

Sub-woofer out with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND

Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER

Headphone Amplifier to drive 32 ohm to 1kohm headphone.

h. CD STANDBY CONTROL

CD Standby Control circuit which switches on the supply to CD servo control IC, HF circuit and the laser light pen in CD mode only.

i. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF6 Board for interfacing with power board of different output power.

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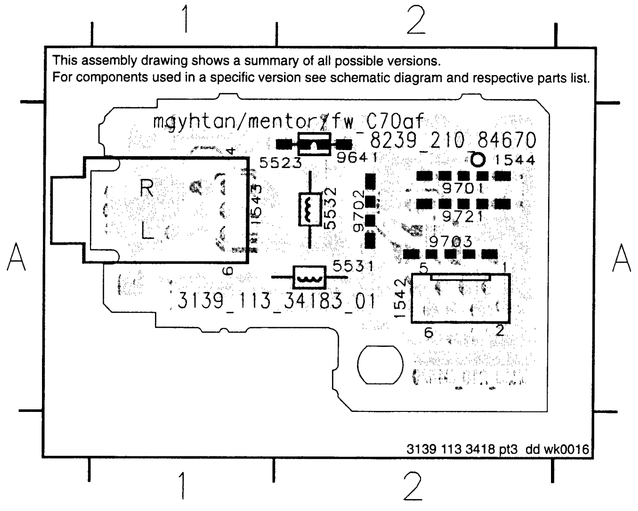
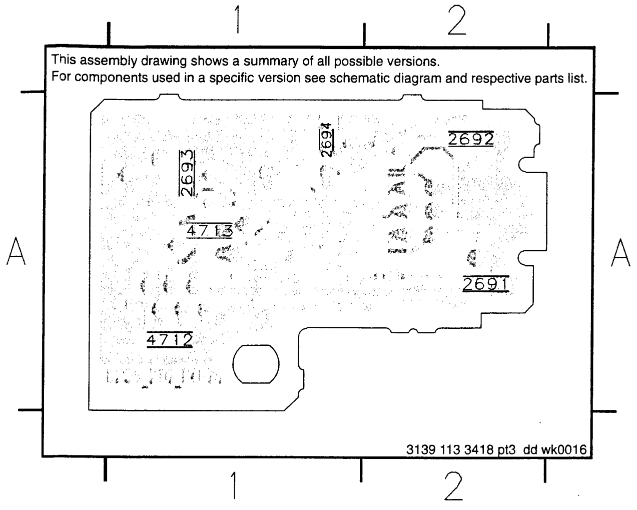
HEADPHONE BOARD - COMPONENT LAYOUT

1542	A2	5523	A2	9641	A2	9703	A2
1543	A1	5531	A2	9701	A2	9721	A2
1544	A2	5532	A2	9702	A2		


1
2
A
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.
mgyhtan/mentor/fw_C70af
8239_210_84670
5523
9641
1544
R
L
1543
5532
9702
9701
9721
9703
5531
3139_113_34183_01
1542
6
2
3139 113 3418 pt3 dd wk0016

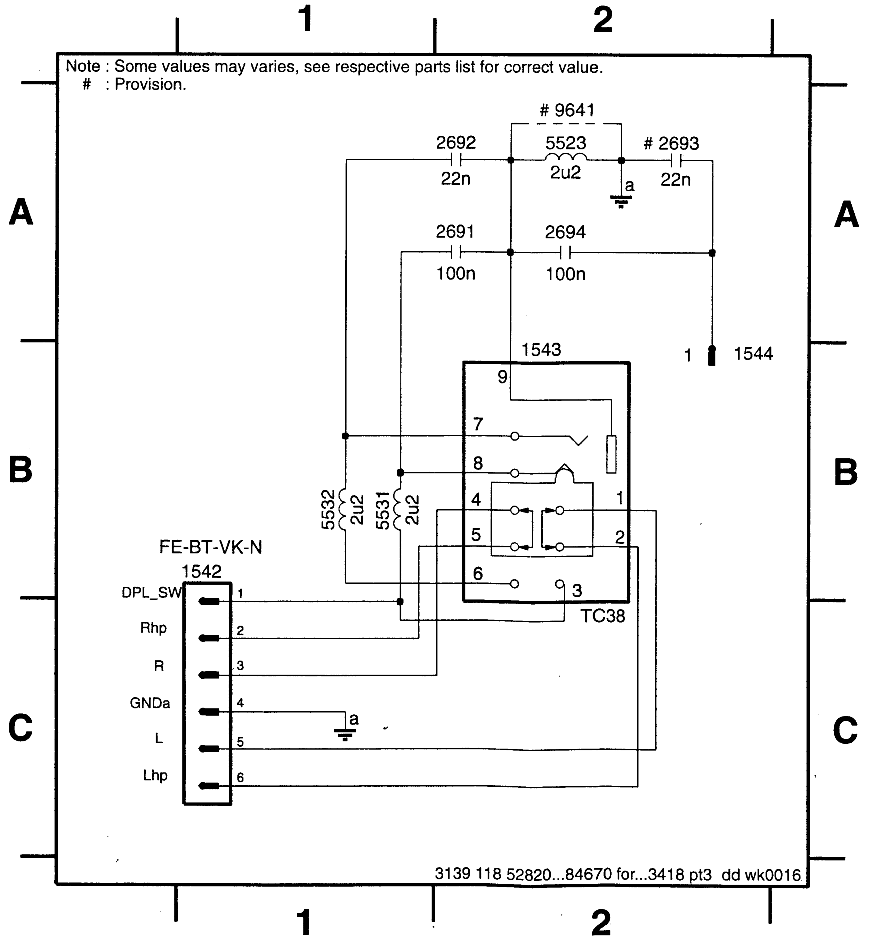
HEADPHONE BOARD - CHIP LAYOUT

2691	A2	2693	A1	4712	A1
2692	A2	2694	A1	4713	A1


1
2
A
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.
2694
2692
2693
4713
2691
4712
3139 113 3418 pt3 dd wk0016

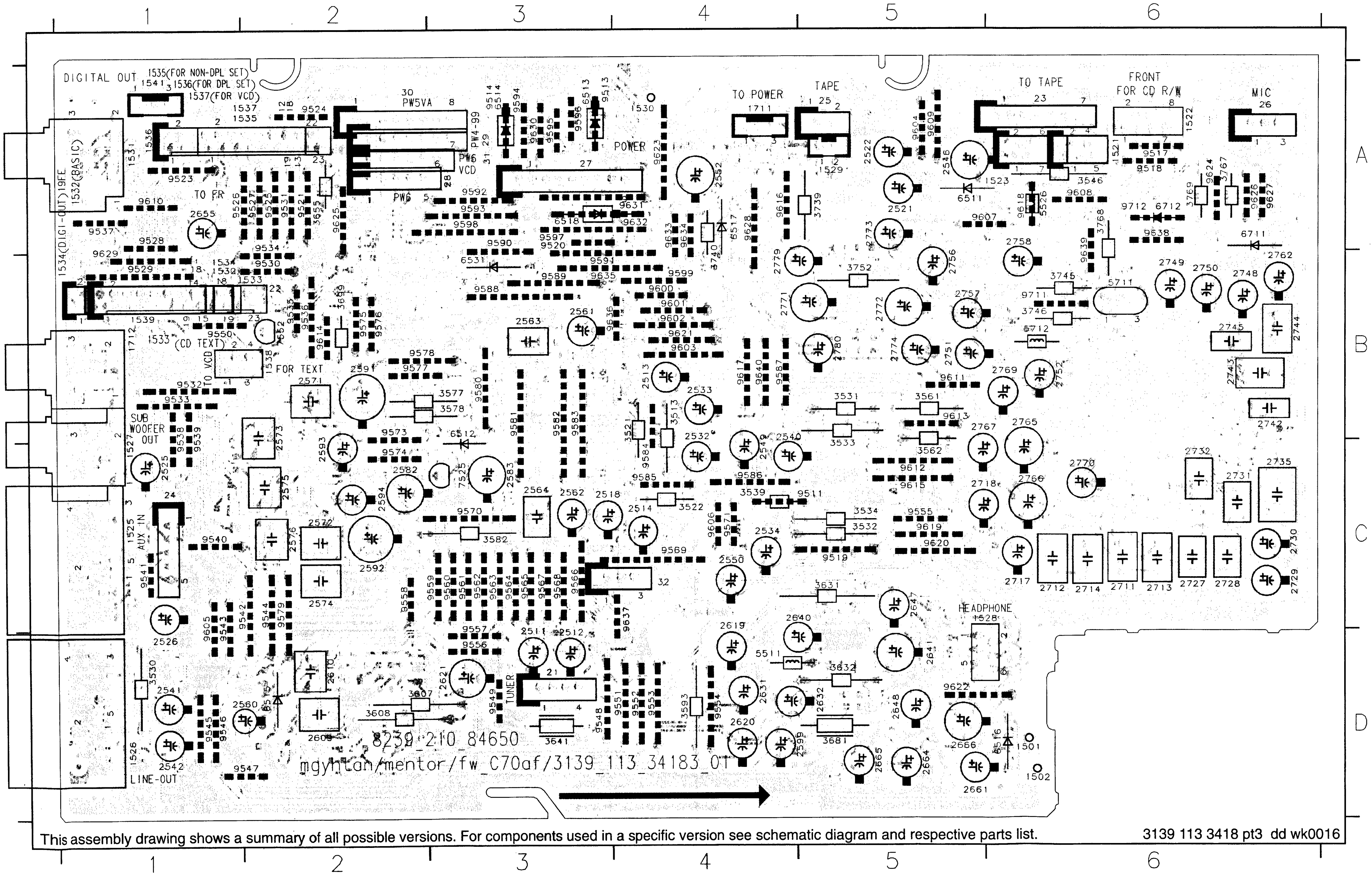
HEADPHONE BOARD - CIRCUIT DIAGRAM

1542	**B1**	**1544**	**B2**	**2692**	**A2**	**2694**	**A2**	**5531**	**B1**	**9641**	**A2**
1543	**B2**	**2691**	**A2**	**2693**	**A2**	**5523**	**A2**	**5532**	**B1**		


1
2
A
B
C
Note : Some values may varies, see respective parts list for correct value.
# : Provision.
# 9641
2692
22n
5523
2u2
# 2693
22n
a
2691
100n
2694
100n
1543
1
1544
9
7
8
4
5
6
1
2
3
TC38
5532
2u2
5531
2u2
FE-BT-VK-N
1542
DPL_SW
Rhp
R
GNDa
L
Lhp
a
3139 118 52820...84670 for...3418 pt3 dd wk0016

AF6 BOARD - COMPONENT LAYOUT

21 D3	1522 A6	1537 A2	2526 D1	2563 B3	2599 D5	2664 D5	2732 C6	2762 B6	3522 C4	3607 D2	3768 A6	6531 B3	9524 A2	9538 B1	9552 D4	9566 C3	9581 B3	9595 A3	9609 A5	9623 A4	9637 C4
23 A6	1523 A6	1538 B2	2532 B4	2564 C3	2609 D2	2665 D5	2735 C6	2765 B6	3530 D1	3608 D2	3769 A6	6711 A6	9525 A2	9539 B1	9553 D4	9567 C3	9582 B3	9596 A3	9610 A1	9624 A6	9638 A6
24 C1	1525 C1	1539 B1	2533 B4	2571 B2	2610 D2	2666 D5	2742 B6	2766 C6	3531 B5	3631 C5	5511 D4	6712 A6	9526 A1	9540 C1	9554 D4	9568 C3	9583 B3	9597 A3	9611 B5	9625 A2	9639 B6
25 A5	1526 D1	1541 A1	2534 C4	2572 C2	2619 C4	2711 C6	2743 B6	2767 B5	3532 C5	3632 D5	5526 A6	7525 C3	9527 A2	9541 C1	9555 C5	9569 C4	9584 C4	9598 A3	9612 C5	9626 A6	9640 B4
26 A6	1527 C1	1711 A4	2540 B4	2573 B2	2620 D4	2712 C6	2744 B6	2769 B6	3533 C5	3641 D3	5711 B6	7552 B2	9528 A1	9542 C1	9556 D3	9570 C3	9585 C4	9599 B4	9613 B5	9627 A6	9711 B6
27 A3	1528 C5	1712 B1	2541 D1	2574 C2	2621 D3	2713 C6	2745 B6	2770 C6	3534 C5	3655 A2	5712 B6	9511 C5	9529 B1	9543 C1	9557 C3	9571 C4	9586 C4	9600 B4	9614 B2	9628 A4	9712 A6
28 A3	1529 A5	2511 D3	2542 D1	2575 C2	2631 D4	2714 C6	2748 B6	2771 B4	3539 C4	3681 D5	6511 A5	9513 A3	9530 B2	9544 C2	9558 C2	9573 B2	9587 B4	9601 B4	9615 C5	9629 A1	
29 A3	1530 A4	2512 D3	2546 A5	2576 C2	2632 D5	2717 C6	2749 B6	2772 B5	3546 A6	3699 B2	6512 B3	9514 A3	9531 A2	9545 D1	9559 C3	9574 C2	9588 B3	9602 B4	9616 A4	9630 A3	
30 A2	1531 A1	2513 B4	2549 C4	2582 C2	2640 C5	2718 C5	2750 B6	2773 A5	3561 B5	3739 A5	6513 A3	9517 A6	9532 B1	9546 D1	9560 C3	9575 B2	9589 B3	9603 B4	9617 B4	9631 A4	
31 A3	1532 B1	2514 C4	2550 C4	2583 C3	2641 D5	2727 C6	2751 B5	2774 B5	3562 C5	3740 B4	6514 A3	9518 A6	9533 B1	9547 D2	9561 C3	9576 B2	9590 A3	9604 A5	9618 A6	9632 A4	
32 C4	1533 B2	2518 C3	2552 A4	2591 B2	2647 C5	2728 C6	2752 B6	2779 B4	3577 B3	3745 B6	6515 D2	9519 C5	9534 A2	9548 D3	9562 C3	9577 B2	9591 B3	9605 C1	9619 C5	9633 A4	
1501 D6	1534 B1	2521 A5	2560 D2	2592 C2	2648 D5	2729 C6	2756 B5	2780 B5	3578 B3	3746 B6	6516 D6	9520 A3	9535 B2	9549 D3	9563 C3	9578 B2	9592 A3	9606 C4	9620 C5	9634 A4	
1502 D6	1535 A2	2522 A5	2561 B3	2593 C2	2655 A1	2730 C6	2757 B5	3513 B4	3582 C3	3752 B5	6517 A4	9521 A2	9536 B2	9550 B1	9564 C3	9579 C2	9593 A3	9607 A5	9621 B4	9635 B3	
1521 A6	1536 A1	2525 C1	2562 C3	2594 C2	2661 D5	2731 C6	2758 A6	3521 B4	3593 D4	3767 A6	6518 A3	9523 A1	9537 A1	9551 D4	9565 C3	9580 B3	9594 A3	9608 A6	9622 D5	9636 B3	

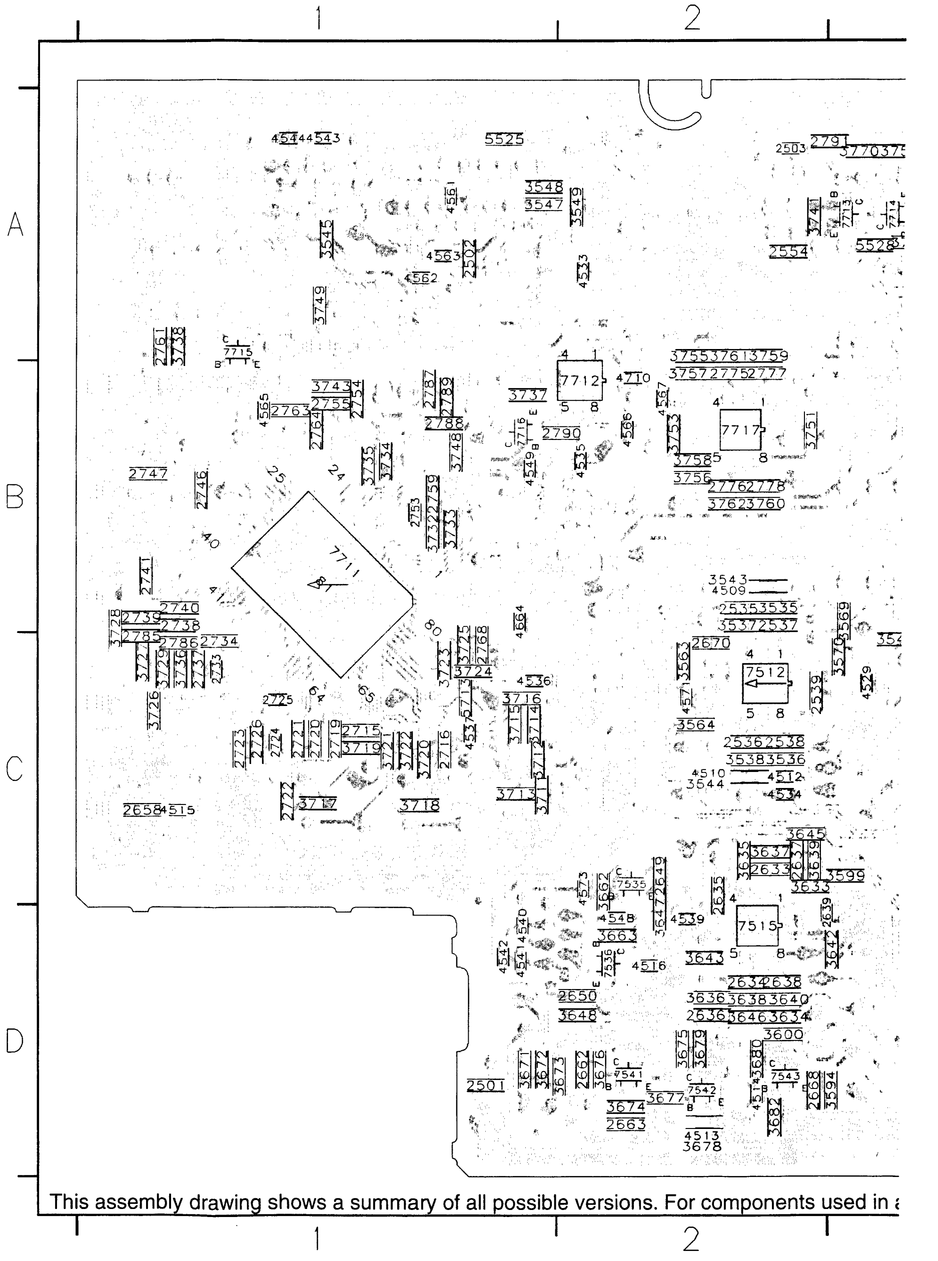


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3418 pt3 dd wk0016

AF6 BOARD - CHIP LAYOUT

2501 D1	2538 C2	2596 C5	2623 B5	2668 D2	2724 C1	2764 B1	3514 C3	3541 C3	3563 C2	35
2502 A1	2539 C2	2597 B5	2624 C5	2669 C6	2725 C1	2768 C1	3515 B3	3542 C3	3564 C2	35
2503 A2	2543 D6	2598 C5	2625 B4	2670 C2	2726 C1	2775 B2	3516 C3	3543 B2	3565 B4	35
2504 D4	2544 D6	2601 D5	2633 C2	2681 B5	2733 C1	2776 B2	3517 B4	3544 C2	3566 C4	35
2515 B3	2545 D6	2602 D5	2634 D2	2682 B6	2734 C1	2777 B2	3518 C4	3545 A1	3567 B4	35
2516 C3	2547 D6	2603 D5	2635 C2	2683 B6	2737 C1	2778 B2	3519 A3	3547 A1	3568 C4	35
2517 B3	2548 D6	2604 D5	2636 D2	2685 A6	2738 B1	2781 A5	3520 A3	3548 A1	3569 B3	35
2519 B4	2551 A3	2605 D5	2637 C2	2686 A6	2739 B1	2785 C1	3523 C6	3549 A2	3570 C3	35
2520 C4	2553 A4	2606 D5	2638 D2	2687 A6	2740 B1	2786 C1	3524 C6	3550 C6	3571 B5	35
2523 B3	2554 A2	2607 D5	2639 D2	2688 A5	2741 B1	2787 B1	3525 C6	3551 A3	3572 C5	35
2524 C3	2565 B4	2608 D5	2649 C2	2689 A5	2746 B1	2788 B1	3526 C6	3552 A3	3573 B5	35
2527 C6	2566 C4	2611 D5	2650 D2	2690 B6	2747 B1	2789 B1	3527 D6	3553 A4	3574 C5	35
2528 C6	2577 B4	2612 D5	2651 A3	2715 C1	2753 B1	2790 B2	3528 D6	3554 A3	3575 B4	35
2529 C6	2578 C4	2613 D5	2652 A4	2716 C1	2754 B1	2791 A3	3529 D6	3555 A3	3576 C4	36
2530 B3	2579 B4	2614 D5	2656 A5	2719 C1	2755 B1	2792 A3	3535 B2	3556 A3	3580 C4	36
2531 C3	2580 C4	2615 D4	2657 B5	2720 C1	2759 B1	3501 C3	3536 C2	3557 A3	3581 B4	36
2535 B2	2581 C4	2616 D5	2658 C1	2721 C1	2760 B6	3502 C3	3537 B2	3558 C5	3583 B5	36
2536 C2	2584 B4	2617 D5	2662 D2	2722 C1	2761 A1	3511 B4	3538 C2	3559 D5	3584 C5	36
2537 B2	2595 B5	2618 D5	2663 D2	2723 C1	2763 B1	3512 C4	3540 C6	3560 D5	3585 B5	36

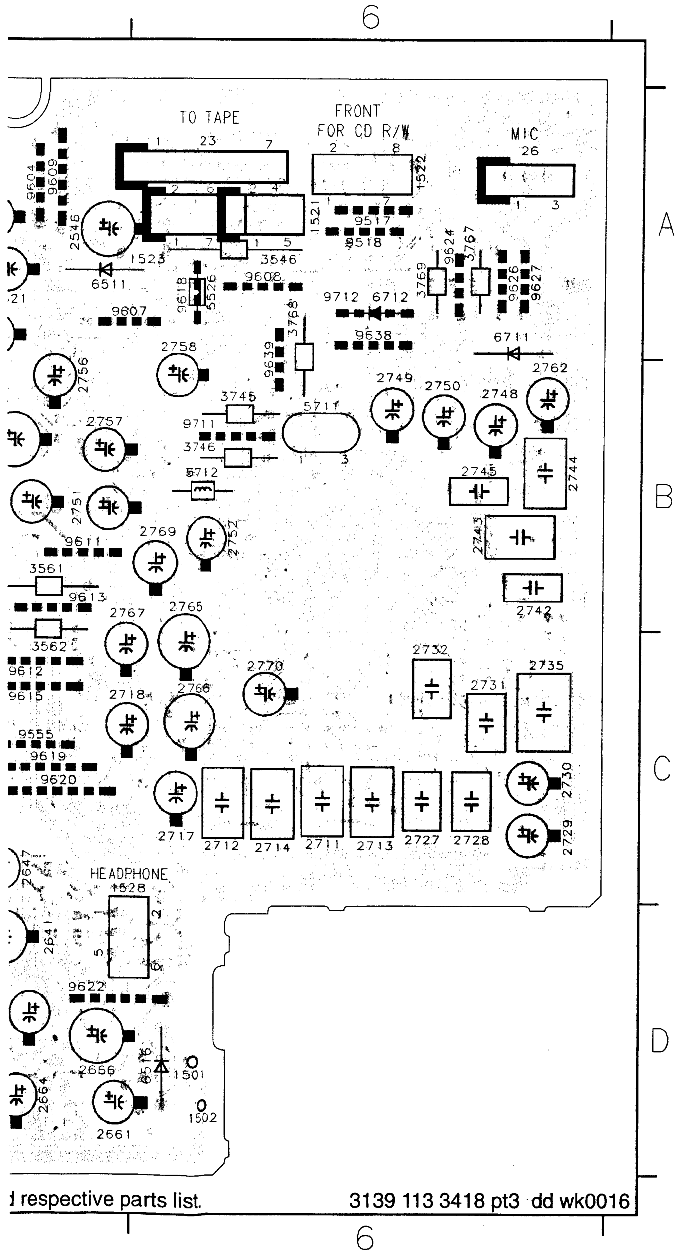


This assembly drawing shows a summary of all possible versions. For components used in

AF6 BOARD - CHIP LAYOUT

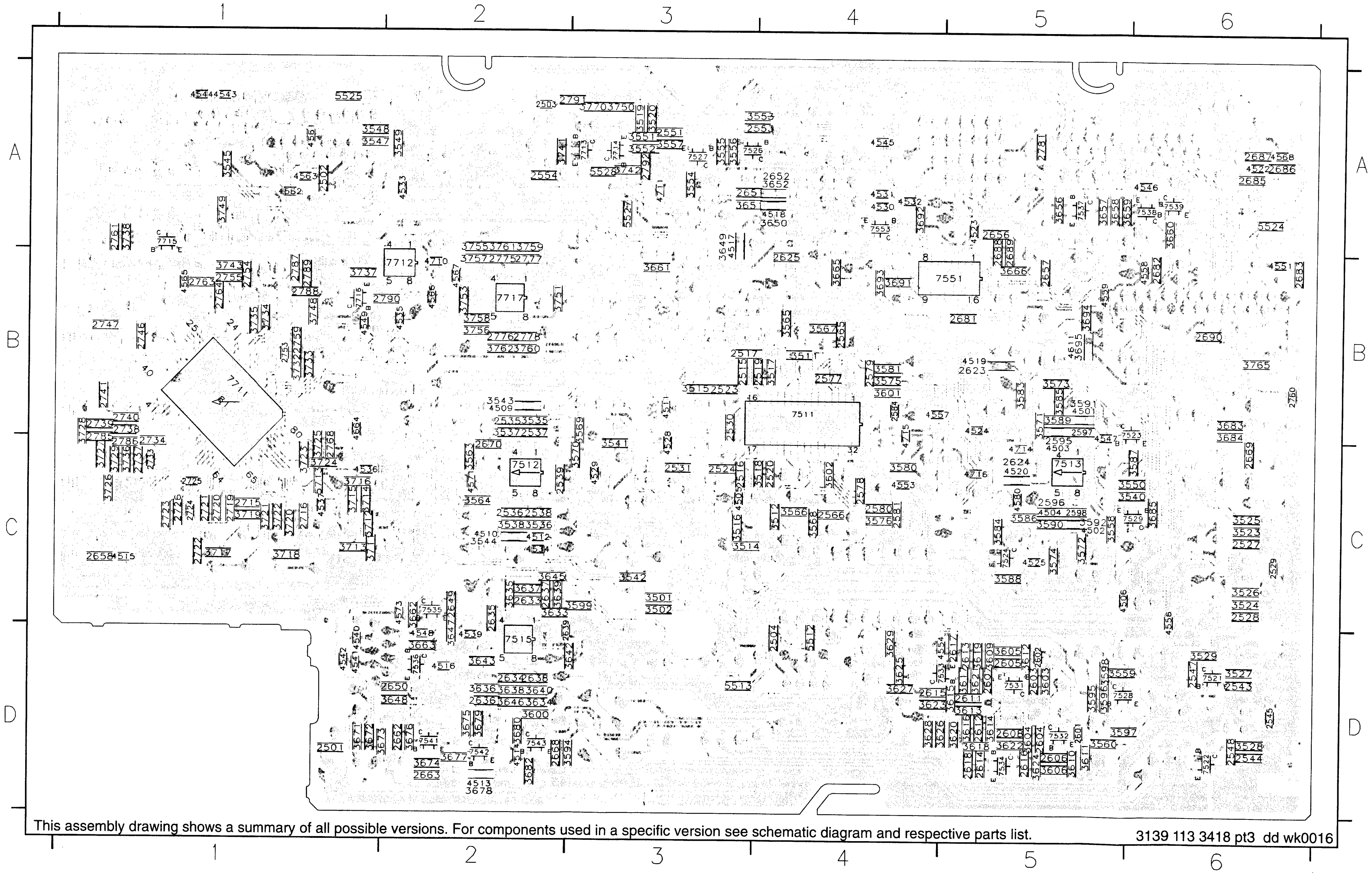
9552 D4	9566 C3	9581 B3	9595 A3	9609 A5	9623 A4	9637 C4
9553 D4	9567 C3	9582 B3	9596 A3	9610 A1	9624 A6	9638 A6
9554 D4	9568 C3	9583 B3	9597 A3	9611 B5	9625 A2	9639 B6
9555 C5	9569 C4	9584 C4	9598 A3	9612 C5	9626 A6	9640 B4
9556 D3	9570 C3	9585 C4	9599 B4	9613 B5	9627 A6	9711 B6
9557 C3	9571 C4	9586 C4	9600 B4	9614 B2	9628 A4	9712 A6
9558 C2	9573 B2	9587 B4	9601 B4	9615 C5	9629 A1	
9559 C3	9574 C2	9588 B3	9602 B4	9616 A4	9630 A3	
9560 C3	9575 B2	9589 B3	9603 B4	9617 B4	9631 A4	
9561 C3	9576 B2	9590 A3	9604 A5	9618 A6	9632 A4	
9562 C3	9577 B2	9591 B3	9605 C1	9619 C5	9633 A4	
9563 C3	9578 B2	9592 A3	9606 C4	9620 C5	9634 A4	
9564 C3	9579 C2	9593 A3	9607 A5	9621 B4	9635 B3	
9565 C3	9580 B3	9594 A3	9608 A6	9622 D5	9636 B3	

2501 D1	2538 C2	2596 C5	2623 B5	2668 D2	2724 C1	2764 B1	3514 C3	3541 C3	3563 C2	3586 C5	3606 D5	3627 D4	3651 A3	3678 D2	3718 C1	3741 A2	4502 C5	4524 B5	4546 A6	4573 C2	7515 D2	7542 D2
2502 A1	2539 C2	2597 B5	2624 C5	2669 C6	2725 C1	2768 C1	3515 B3	3542 C3	3564 C2	3587 C6	3609 D5	3628 D4	3652 A4	3679 D2	3719 C1	3742 A3	4503 C5	4525 C5	4547 B5	4580 C5	7521 D6	7543 D2
2503 A2	2543 D6	2598 C5	2625 B4	2670 C2	2726 C1	2775 B2	3516 C3	3543 B2	3565 B4	3588 C5	3610 D5	3629 D4	3656 A5	3680 D2	3720 C1	3743 B1	4504 C5	4528 C3	4548 D2	4611 B5	7522 D6	7551 B5
2504 D4	2544 D6	2601 D5	2633 C2	2681 B5	2733 C1	2776 B2	3517 B4	3544 C2	3566 C4	3589 B5	3611 D5	3633 C2	3657 A5	3682 D2	3721 C1	3748 B1	4505 C3	4529 C3	4549 B1	4664 B1	7523 B6	7553 A4
2515 B3	2545 D6	2602 D5	2634 D2	2682 B6	2734 C1	2777 B2	3518 C4	3545 A1	3567 B4	3590 C5	3612 D5	3634 D2	3658 A5	3683 B6	3722 C1	3749 A1	4506 C5	4530 A4	4551 B6	4710 B2	7524 C5	7711 B1
2516 C3	2547 D6	2603 D5	2635 C2	2683 B6	2737 C1	2778 B2	3519 A3	3547 A1	3568 C4	3591 B5	3613 D5	3635 C2	3659 A5	3684 B6	3723 C1	3750 A3	4509 B2	4531 A4	4553 C4	4711 A3	7526 A3	7712 B2
2517 B3	2548 D6	2604 D5	2636 D2	2685 A6	2738 B1	2781 A5	3520 A3	3548 A1	3569 B3	3592 C5	3614 D5	3636 D2	3660 A6	3685 C6	3724 C1	3751 B2	4510 C2	4532 A4	4554 D5	4714 C5	7527 A3	7713 A3
2519 B4	2551 A3	2605 D5	2637 C2	2686 A6	2739 B1	2785 C1	3523 C6	3549 A2	3570 C3	3594 D3	3615 D5	3637 C2	3661 B3	3691 B4	3725 C1	3753 B2	4511 B3	4533 A2	4556 C6	4715 B4	7528 D5	7714 A3
2520 C4	2553 A4	2606 D5	2638 D2	2687 A6	2740 B1	2786 C1	3524 C6	3550 C6	3571 B5	3595 D5	3616 D5	3638 D2	3662 C2	3692 A4	3726 C1	3755 A2	4512 C2	4534 C2	4557 B4	4716 C5	7529 C6	7715 A1
2523 B3	2554 A2	2607 D5	2639 D2	2688 A5	2741 B1	2787 B1	3525 C6	3551 A3	3572 C5	3596 D5	3617 D5	3639 C2	3663 D2	3693 B4	3727 C1	3756 B2	4513 D2	4535 B2	4558 B6	5512 D4	7531 D5	7716 B1
2524 C3	2565 B4	2608 D5	2649 C2	2689 A5	2746 B1	2788 B1	3526 C6	3552 A3	3573 B5	3597 D5	3618 D5	3640 D2	3665 B4	3694 B5	3728 B1	3757 B2	4514 D2	4536 C1	4559 B5	5513 D3	7532 D5	7717 B2
2527 C6	2566 C4	2611 D5	2650 D2	2690 B6	2747 B1	2789 B1	3527 D6	3553 A4	3574 C5	3598 D5	3619 D5	3642 D3	3666 B5	3695 B5	3729 C1	3758 B2	4515 C1	4537 C1	4561 A1	5524 A6	7533 D5	
2528 C6	2577 B4	2612 D5	2651 A3	2715 C1	2753 B1	2790 B2	3528 D6	3554 A3	3575 B4	3599 C3	3620 D5	3643 D2	3671 D1	3711 C1	3732 B1	3759 A2	4516 D2	4539 D2	4562 A1	5525 A1	7534 D5	
2529 C6	2578 C4	2613 D5	2652 A4	2716 C1	2754 B1	2791 A3	3529 D6	3555 A3	3576 C4	3600 D2	3621 D5	3645 C2	3672 D1	3712 C1	3733 B1	3760 B2	4517 A3	4540 D1	4563 A1	5527 A3	7535 C2	
2530 B3	2579 B4	2614 D5	2656 A5	2719 C1	2755 B1	2792 A3	3535 B2	3556 A3	3580 C4	3601 B4	3622 D5	3646 D2	3673 D2	3713 C1	3734 B1	3761 A2	4518 A4	4541 D1	4565 B1	5528 A3	7536 D2	
2531 C3	2580 C4	2615 D4	2657 B5	2720 C1	2759 B1	3501 C3	3536 C2	3557 A3	3581 B4	3602 C4	3623 D4	3647 D2	3674 D2	3714 C1	3735 B1	3762 B2	4519 B5	4542 D1	4566 B2	5713 C1	7537 A5	
2535 B2	2581 C4	2616 D5	2658 C1	2721 C1	2760 B6	3502 C3	3537 B2	3558 C5	3583 B5	3603 D5	3624 D5	3648 D2	3675 D2	3715 C1	3736 C1	3765 B6	4520 C5	4543 A1	4567 B2	7511 B4	7538 A6	
2536 C2	2584 B4	2617 D5	2662 D2	2722 C1	2761 A1	3511 B4	3538 C2	3559 D5	3584 C5	3604 D5	3625 D4	3649 A3	3676 D2	3716 C1	3737 B1	3770 A3	4522 A6	4544 A1	4568 A6	7512 C2	7539 A6	
2537 B2	2595 B5	2618 D5	2663 D2	2723 C1	2763 B1	3512 C4	3540 C6	3560 D5	3585 B5	3605 D5	3626 D5	3650 A4	3677 D2	3717 C1	3738 A1	4501 B5	4523 A5	4545 A4	4571 C2	7513 C5	7541 D2	



d respective parts list.

3139 113 3418 pt3 dd wk0016



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3418 pt3 dd wk0016

AF6 BOARD - CIRCUIT DIAGRAM (PART 1)

21 D2
23 A2
24 F3
25 C2
26 I2
27 E18
28 H17
29 H18
30 H19
31 H18
1501 J12
1502 J12
1521 A1
1522 B2
1523 A2
1525 E2
1525 F2
1526 G2
1526 H2
1527 H18
1528 D18
1529 C2
1530 J14
2501 J12
2502 B3
2503 D2
2504 E3
2511 D4
2512 D4
2513 D6
2514 E6
2515 E6
2516 F6
2517 E6
2518 D6
2519 D6
2520 F6
2521 D5
2522 E5
2523 E4
2524 F4
2525 E3
2526 F3
2527 E3
2528 F3
2529 F1
2530 C9
2531 D6
2532 D6
2533 C7
2534 H7
2535 C6
2536 I7
2537 B6
2538 I6
2539 I6
2540 I14
2541 F5
2542 H4
2543 G3
2544 G3
2545 G1
2546 A4
2547 G5
2548 H5
2549 A6
2550 J6
2551 J4
2552 I3
2553 I4
2554 D2
2560 G12
2561 C8
2562 F8
2563 B7
2564 G7
2565 B8
2566 G8
2571 B9
2572 H9
2573 B10
2574 H10
2575 B10
2576 H9
2577 C9
2578 F9
2579 C11
2580 F11
2581 C3
2582 C4
2583 C4
2584 C4
2591 C8
2592 G9
2593 C8
2594 I9
2595 B9
2596 H9
2597 B8
2598 I8
2599 F14
2601 D11
2602 E11
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2606 E12
2607 B13
2608 D13
2609 C12
2610 F12
2611 C12
2612 F12
2613 D13
2614 F13
2615 C13
2616 E13
2617 C14
2618 E13
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2621 I16
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2634 E15
2635 B15
2636 E15
2637 B15
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2639 F16
2640 E16
2641 I15
2647 B16
2648 D16
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2652 F17
2655 C17
2656 E18
2657 E18
2658 I12
2661 G14
2662 H14
2663 G15
2664 G15
2665 G16
2666 G16
2668 H17
2669 G18
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3501 J13
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3511 D4
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7542 H16
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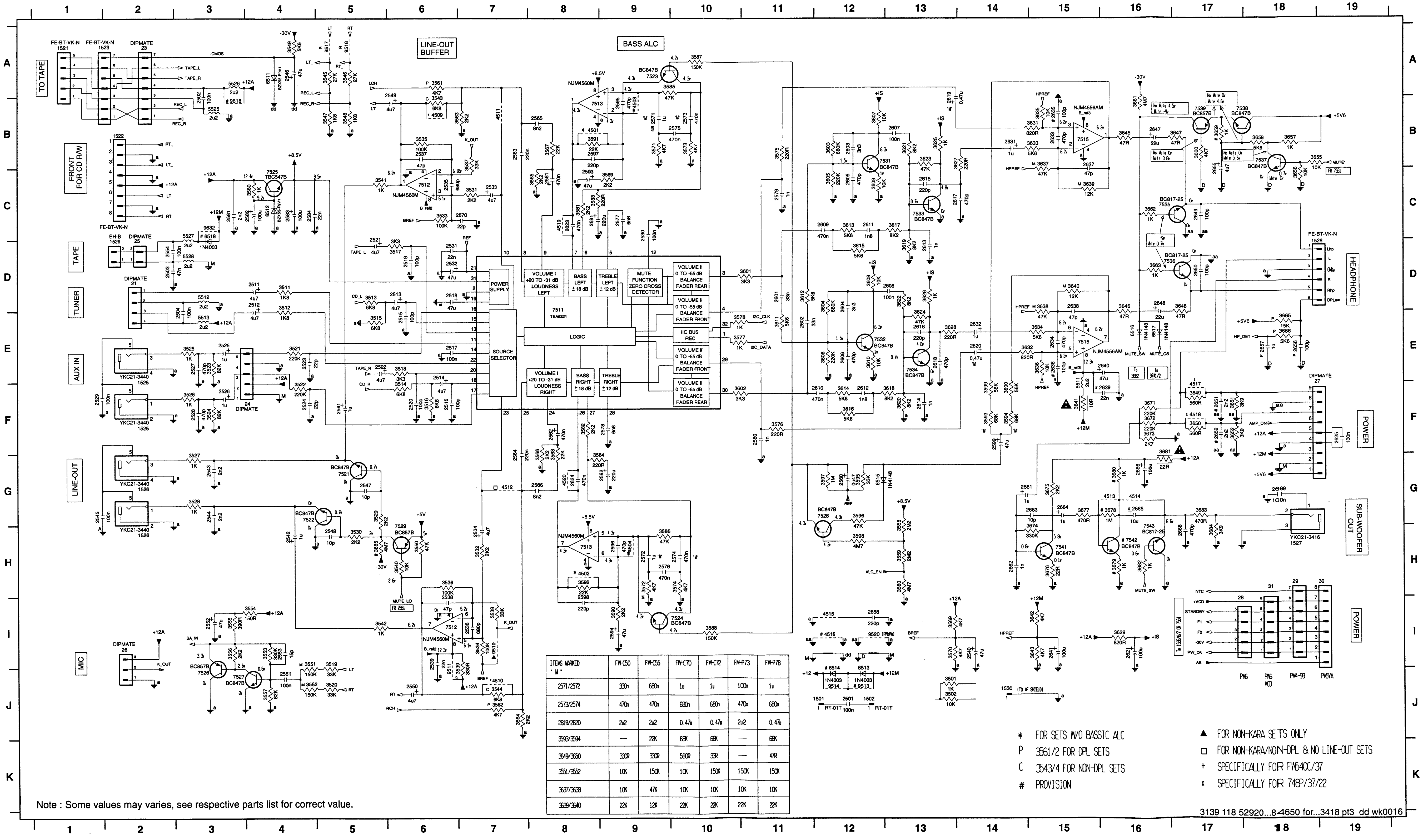

TO TAPE
FRONT FOR CD R/W
TAPE
TUNER
AUX IN
LINE-OUT
MIC
LINE-OUT BUFFER
BASS ALC
POWER SUPPLY
VOLUME I +20 TO -31 dB LOUDNESS LEFT
BASS LEFT ±18 dB
TREBLE LEFT ±12 dB
MUTE FUNCTION ZERO CROSS DETECTOR
VOLUME II 0 TO -55 dB BALANCE FADER REAR
VOLUME II 0 TO -55 dB BALANCE FADER FRONT
7511 TEA6321
LOGIC
SOURCE SELECTOR
IIC BUS REC
VOLUME I +20 TO -31 dB LOUDNESS RIGHT
BASS RIGHT ±18 dB
TREBLE RIGHT ±12 dB
HEADPHONE
POWER
SUB-WOOFER OUT
PW6
PW6 VCD
PW4-99
PW6VA
1530 (TO AF SHIELD)

ITEMS MARKED " M "	FW-C50	FW-C55	FW-C70	FW-C72	FW-P73	FW-P78
2571/2572	330n	680n	1u	1u	100n	1u
2573/2574	470n	470n	680n	680n	470n	680n
2619/2620	2u2	2u2	0.47u	0.47u	2u2	0.47u
3593/3594	—	22K	68K	68K	—	68K
3649/3650	330R	330R	560R	33R	—	47R
3551/3552	10K	150K	10K	150K	150K	150K
3637/3638	10K	47K	10K	10K	10K	10K
3639/3640	22K	12K	22K	22K	22K	22K

* FOR SETS W/O BASSIC ALC
P 3561/2 FOR DPL SETS
C 3543/4 FOR NON-DPL SETS
PROVISION

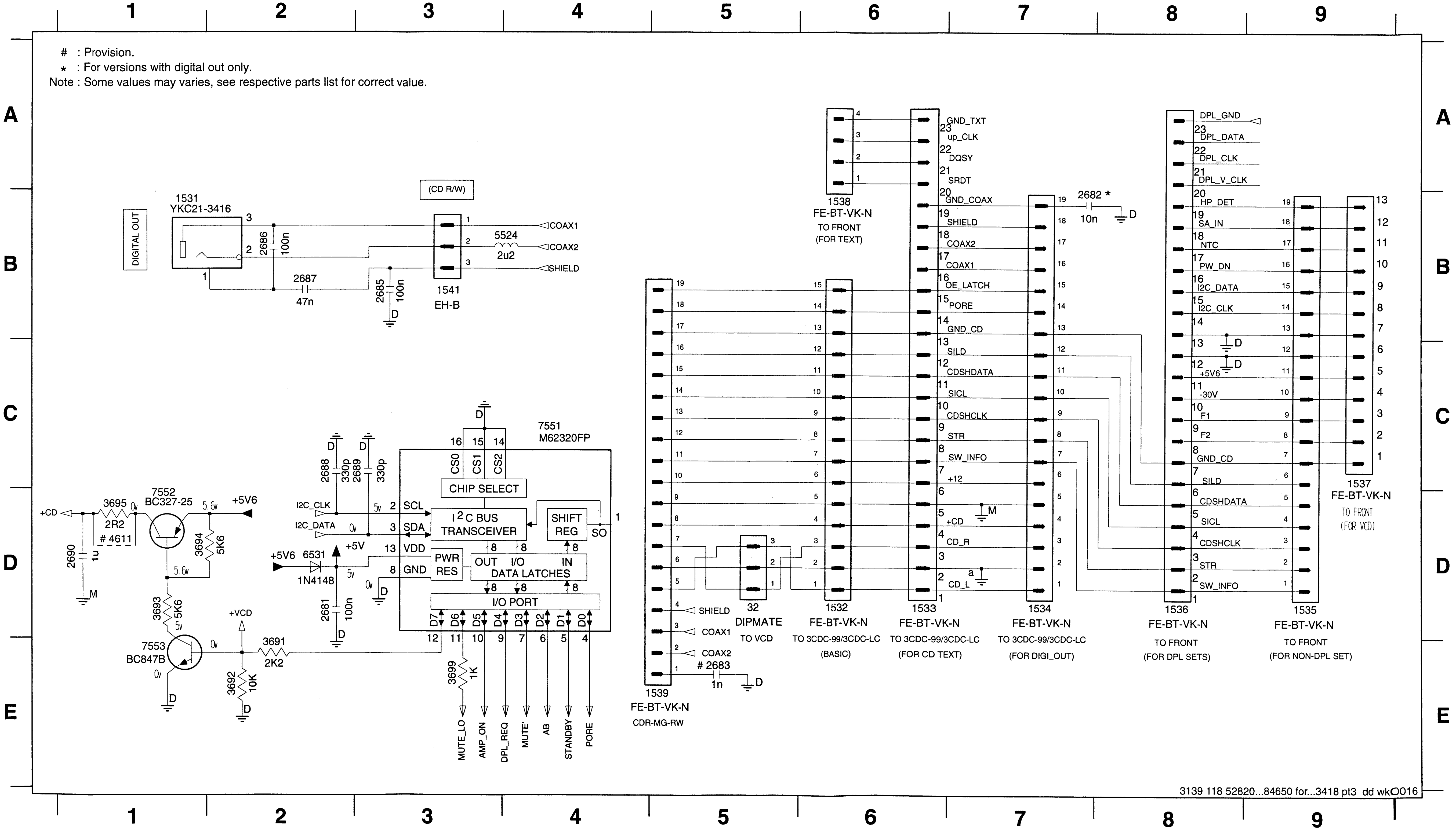
▲ FOR NON-KARA SETS ONLY
□ FOR NON-KARA/NON-DPL & NO LINE-OUT SETS
+ SPECIFICALLY FOR FW540C/37
x SPECIFICALLY FOR 748P/37/22

Note : Some values may varies, see respective parts list for correct value.

3139 118 52920...8-4650 for...3418 pt3 dd wk0016

AF6 BOARD - CIRCUIT DIAGRAM (PART 2)

32	D5
1531	B1
1532	D6
1533	D6
1534	D7
1535	D9
1536	D8
1537	C9
1538	B6
1539	E5
1541	B3
2681	D2
2682	B7
2683	E5
2685	B3
2686	B2
2687	B2
2688	C2
2689	C3
2690	D1
3691	E2
3692	E2
3693	D1
3694	D1
3695	D1
3699	E3
4611	D1
5524	B4
6531	D2
7551	C4
7552	D1
7553	E1

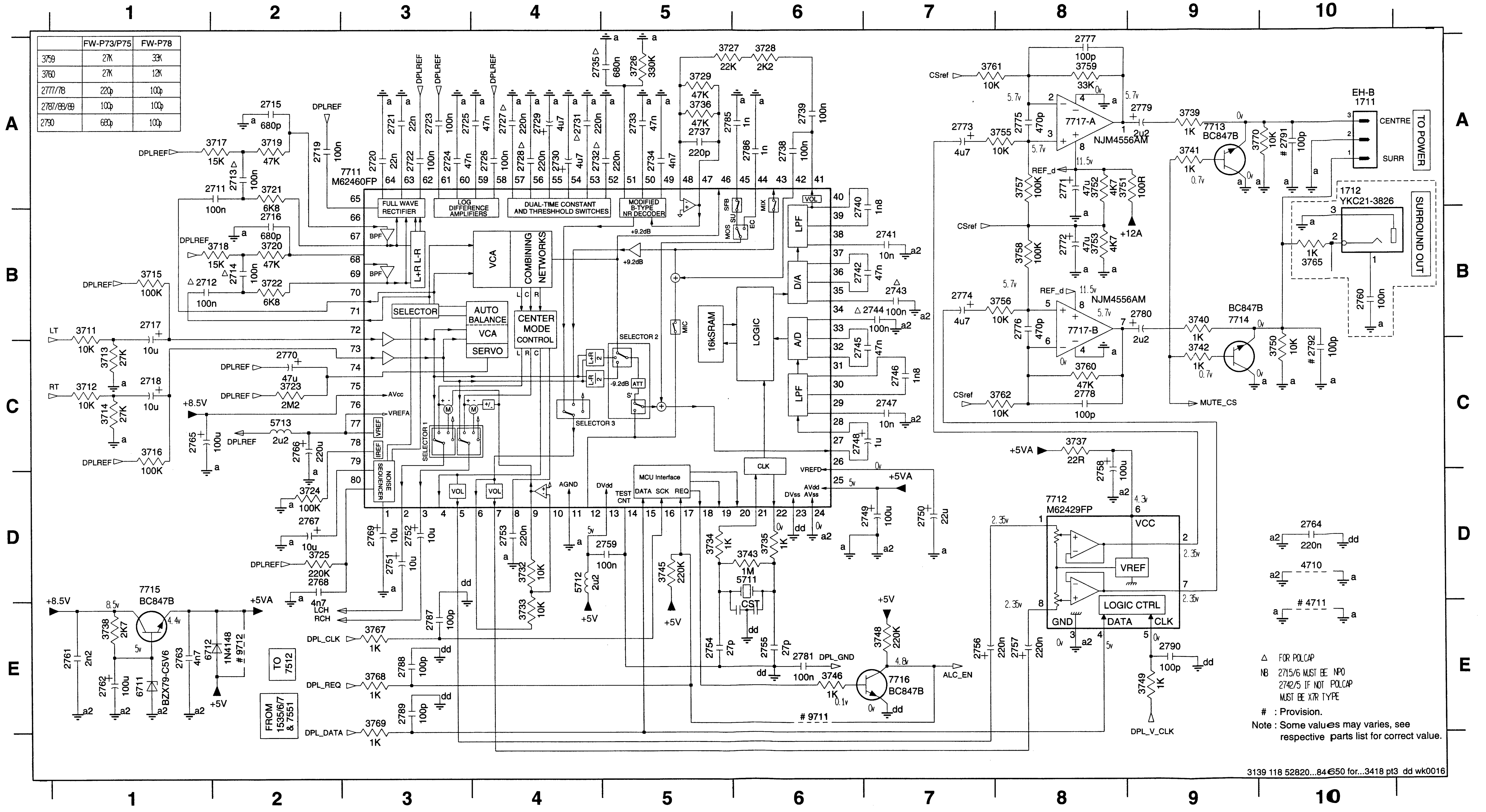


1 2 3 4 5 6 7 8 9
A B C D E
DIGITAL OUT
1531
YKC21-3416
2686 100n
2687 47n
2685 100n
(CD R/W)
1541
EH-B
5524 2u2
COAX1
COAX2
SHIELD
7551
M62320FP
CS0 CS1 CS2
CHIP SELECT
I2C BUS TRANSCEIVER
SHIFT REG
SO
SCL
SDA
VDD
GND
PWR RES
OUT I/O IN DATA LATCHES
I/O PORT
D7 D6 D5 D4 D3 D2 D1 D0
I2C_CLK
I2C_DATA
2688 330p
2689 330p
+5V6
6531
1N4148
+5V
2681 100n
3699 1K
MUTE_LO
AMP_ON
DPL_REQ
MUTE'
AB
STANDBY
PORE
+CD
3695 2R2
# 4611
2690 1u
7552
BC327-25
3694 5K6
3693 5K6
7553
BC847B
+VCD
3691 2K2
3692 10K
1538
FE-BT-VK-N
TO FRONT
(FOR TEXT)
1539
FE-BT-VK-N
CDR-MG-RW
SHIELD
COAX1
COAX2
# 2683 1n
32
DIPMATE
TO VCD
1532
FE-BT-VK-N
TO 3CDC-99/3CDC-LC
(BASIC)
1533
FE-BT-VK-N
TO 3CDC-99/3CDC-LC
(FOR CD TEXT)
GND_TXT
up_CLK
DQSY
SRDT
GND_COAX
SHIELD
COAX2
COAX1
OE_LATCH
PORE
GND_CD
SILD
CDSHDATA
SICL
CDSHCLK
STR
SW_INFO
+12
+CD
CD_R
CD_L
1534
FE-BT-VK-N
TO 3CDC-99/3CDC-LC
(FOR DIGI_OUT)
2682 *
10n
1536
FE-BT-VK-N
TO FRONT
(FOR DPL SETS)
DPL_GND
DPL_DATA
DPL_CLK
DPL_V_CLK
HP_DET
SA_IN
NTC
PW_DN
I2C_DATA
I2C_CLK
+5V6
-30V
F1
F2
GND_CD
SILD
CDSHDATA
SICL
CDSHCLK
STR
SW_INFO
1535
FE-BT-VK-N
TO FRONT
(FOR NON-DPL SET)
1537
FE-BT-VK-N
TO FRONT
(FOR VCD)
3139 118 52820...84650 for...3418 pt3 dd wk0016

# : Provision.
* : For versions with digital out only.
Note : Some values may varies, see respective parts list for correct value.

DOLBY PROLOGIC (DPL) - CIRCUIT DIAGRAM

1711 A10
1712 A10
2711 A2
2712 B1
2713 A2
2714 B2
2715 A2
2716 B2
2717 B1
2718 C1
2719 A2
2720 A3
2721 A3
2722 A3
2723 A3
2724 A3
2725 A3
2726 A4
2727 A4
2728 A4
2729 A4
2730 A4
2731 A4
2732 A4
2733 A5
2734 A5
2735 A4
2737 A5
2738 A6
2739 A6
2740 A6
2741 B7
2742 B6
2743 B7
2744 B7
2745 C6
2746 C7
2747 C7
2748 C6
2749 D7
2750 D7
2751 D3
2752 D3
2753 D4
2754 E5
2755 E6
2756 E7
2757 E8
2758 C8
2759 D5
2760 B10
2761 E1
2762 E1
2763 E1
2764 D10
2765 C1
2766 C2
2767 D2
2768 D2
2769 D3
2770 C2
2771 A8
2772 B8
2773 A7
2774 B7
2775 A8
2776 B8
2777 A8
2778 C8
2779 A9
2780 B9
2781 E6
2785 A5
2786 A6
2787 E3
2788 E3
2789 E3
2790 E9
2791 A10
2792 C10
3711 B1
3712 C1
3713 C1
3714 C1
3715 B1
3716 C1
3717 A2
3718 B2
3719 A2
3720 B2
3721 A2
3722 B2
3723 C2
3724 D2
3725 D2
3726 A5
3727 A5
3728 A6
3729 A5
3732 D4
3733 E4
3734 D5
3735 D6
3736 A5
3737 C8
3738 E1
3739 A9
3740 B9
3741 A9
3742 C9
3743 D6
3745 D5
3746 E6
3748 E7
3749 E9
3750 C10
3751 A8
3752 A8
3753 B8
3755 A8
3756 B8
3757 A8
3758 B8
3759 A8
3760 C8
3761 A7
3762 C8
3765 B10
3767 E3
3768 E3
3769 E3
3770 A9
4710 D10
4711 E10
5711 D6
5712 D4
5713 C2
6711 E1
6712 E1
7711 A3
7712 D8
7713 A9
7714 B9
7715 D1
7716 E7
7717-A A8
7717-B B8
9711 E6
9712 E2


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
7711
M62460FP
FULL WAVE RECTIFIER
LOG DIFFERENCE AMPLIFIERS
DUAL-TIME CONSTANT AND THRESHHOLD SWITCHES
MODIFIED B-TYPE NR DECODER
VCA
COMBINING NETWORKS
SELECTOR
AUTO BALANCE
VCA
SERVO
CENTER MODE CONTROL
SELECTOR 1
SELECTOR 2
SELECTOR 3
16kSRAM
LOGIC
D/A
A/D
LPF
CLK
MCU Interface
DATA SCK REQ
NOISE SEQUENCER
VREF
IREF
VOL
AGND
DVdd
TEST CNT
DVss AVss
AVdd
VREFD
7717-A
7717-B
NJM4556AM
7712
M62429FP
VCC
VREF
LOGIC CTRL
GND
DATA
CLK
7713
BC847B
7714
BC847B
7715
BC847B
7716
BC847B
EH-B
1711
CENTRE
SURR
TO POWER
1712
YKC21-3826
SURROUND OUT
LT
RT
DPLREF
CSref
MUTE_CS
ALC_EN
DPL_CLK
DPL_REQ
DPL_DATA
DPL_V_CLK
DPL_GND
LCH
RCH
TO 7512
FROM 1535/6/7 & 7551
+8.5V
+5VA
+5V
+12A
BZX79-C5V6
1N4148
5711
CST
# 9711
# 9712
2764
220n
4710
# 4711

	FW-P73/P75	FW-P78
3759	27K	33K
3760	27K	12K
2777/78	220p	100p
2787/88/89	100p	100p
2790	680p	100p

△ FOR POLCAP

NB 2715/6 MUST BE NPO
2742/5 IF NOT POLCAP
MUST BE X7R TYPE

# : Provision.

Note : Some valuees may varies, see
respective parts list for correct value.

3139 118 52820...84650 for...3418 pt3 dd wk0016

MISCELLANEOUS

1523	4822 267 10953	Flex Connector 7P
1525	4822 267 20452	Cinch Socket - Aux in
1526	4822 267 20452	Cinch Socket - Line-out
1527	4822 267 31729	Cinch Socket - Sub-Woofer out
1528	4822 267 10731	Flex Connector 6P
1537	4822 267 10738	Flex Connector 13P
1542	4822 267 10731	Flex Connector 6P
1543	4822 265 11529	Headphone Socket

CAPACITORS

2501	4822 126 14585	100nF 10% 50V
2502	4822 126 13838	100nF +80/-20% 50V
2504	4822 126 13838	100nF +80/-20% 50V
2511	4822 124 40769	4,7μF 20% 100V
2512	4822 124 40769	4,7μF 20% 100V
2513	4822 124 40769	4,7μF 20% 100V
2514	4822 124 40769	4,7μF 20% 100V
2515	5322 122 32531	100pF 5% 50V
2516	5322 122 32531	100pF 5% 50V
2517	4822 126 14585	100nF 10% 50V
2518	4822 124 40433	47μF 20% 25V
2519	5322 122 32531	100pF 5% 50V
2520	5322 122 32531	100pF 5% 50V
2521	4822 124 40769	4,7μF 20% 100V
2522	4822 124 40769	4,7μF 20% 100V
2523	5322 122 32658	22pF 5% 50V
2524	5322 122 32658	22pF 5% 50V
2525	4822 124 21913	1μF 20% 63V
2526	4822 124 21913	1μF 20% 63V
2527	5322 122 34099	470pF 10% 63V
2528	5322 122 34099	470pF 10% 63V
2529	4822 126 13838	100nF +80/-20% 50V
2530	4822 126 14585	100nF 10% 50V
2531	5322 122 32654	22nF 10% 63V
2532	4822 124 40433	47μF 20% 25V
2533	4822 124 40769	4,7μF 20% 100V
2534	4822 124 40769	4,7μF 20% 100V
2535	4822 122 32535	680pF 10% 63V
2536	4822 122 32535	680pF 10% 63V
2537	4822 126 13692	47pF 1% 63V
2538	4822 126 13692	47pF 1% 63V
2539	5322 122 32654	22nF 10% 63V
2540	4822 124 40433	47μF 20% 25V
2541	4822 124 21913	1μF 20% 63V
2542	4822 124 21913	1μF 20% 63V
2543	4822 122 33127	2,2nF 10% 63V
2544	4822 122 33127	2,2nF 10% 63V
2545	4822 126 13838	100nF +80/-20% 50V
2546	4822 124 41751	47μF 20% 50V
2547	5322 122 32448	10pF 5% 63V
2548	5322 122 32448	10pF 5% 63V
2549	4822 124 40769	4,7μF 20% 100V
2550	4822 124 40769	4,7μF 20% 100V
2551	4822 126 14585	100nF 10% 50V
2552	4822 124 41751	47μF 20% 50V
2553	4822 126 13486	15pF 2% 63V
2554	4822 126 13838	100nF +80/-20% 50V
2560	4822 124 41407	0,47μF 20% 63V
2561	4822 124 41407	0,47μF 20% 63V
2562	4822 124 41407	0,47μF 20% 63V
2563	4822 121 42408	220nF 5% 63V
2564	4822 121 42408	220nF 5% 63V
2565	4822 126 10525	8,2nF 10% 63V
2566	4822 126 10525	8,2nF 10% 63V
2571	5322 121 42498	680nF 5% 63V
2572	5322 121 42498	680nF 5% 63V
2573	4822 121 51252	470nF 5% 63V
2574	4822 121 51252	470nF 5% 63V
2575	4822 121 51252	470nF 5% 63V
2576	4822 121 51252	470nF 5% 63V
2577	5322 122 31866	6,8nF 10% 63V
2578	5322 122 31866	6,8nF 10% 63V
2579	5322 122 31647	1nF 10% 63V
2580	5322 122 31647	1nF 10% 63V
2581	4822 122 33127	2,2nF 10% 63V
2582	4822 124 40207	100μF 20% 25V
2583	4822 124 40207	100μF 20% 25V
2584	5322 122 32654	22nF 10% 63V
2591	4822 124 80144	220μF 20% 25V
2592	4822 124 80144	220μF 20% 25V
2593	4822 124 40433	47μF 20% 25V
2594	4822 124 40433	47μF 20% 25V
2595	5322 122 34099	470pF 10% 63V
2596	5322 122 34099	470pF 10% 63V
2597	4822 122 33575	220pF 5% 63V
2598	4822 122 33575	220pF 5% 63V
2599	4822 124 41751	47μF 20% 50V
2601	4822 126 12105	33nF 5% 50V
2602	4822 126 12105	33nF 5% 50V
2603	4822 122 33891	3,3nF 10% 63V
2604	4822 122 33891	3,3nF 10% 63V
2605	5322 122 34099	470pF 10% 63V
2606	5322 122 34099	470pF 10% 63V
2607	4822 126 14585	100nF 10% 50V
2608	4822 126 14585	100nF 10% 50V
2609	4822 121 51252	470nF 5% 63V
2610	4822 121 51252	470nF 5% 63V
2611	4822 126 10847	1,8nF 10% 63V
2612	4822 126 10847	1,8nF 10% 63V
2613	5322 122 31647	1nF 10% 63V
2614	5322 122 31647	1nF 10% 63V
2615	4822 122 33575	220pF 5% 63V
2616	4822 122 33575	220pF 5% 63V
2617	5322 122 34099	470pF 10% 63V
2618	5322 122 34099	470pF 10% 63V
2619	4822 124 22652	2,2μF 20% 50V
2620	4822 124 22652	2,2μF 20% 50V
2621	4822 124 40207	100μF 20% 25V
2623	4822 126 13482	470nF +80/-20% 16V
2624	4822 126 13482	470nF +80/-20% 16V
2625	4822 126 13838	100nF +80/-20% 50V
2631	4822 124 21913	1μF 20% 63V
2632	4822 124 21913	1μF 20% 63V
2633	5322 122 34099	470pF 10% 63V
2634	5322 122 34099	470pF 10% 63V
2635	5322 122 32531	100pF 5% 50V
2636	5322 122 32531	100pF 5% 50V
2637	4822 126 13692	47pF 1% 63V
2638	4822 126 13692	47pF 1% 63V
2639	5322 122 32654	22nF 10% 63V
2640	4822 124 40433	47μF 20% 25V
2641	4822 124 40207	100μF 20% 25V
2647	4822 124 81151	22μF 50V
2648	4822 124 81151	22μF 50V
2649	5322 122 32531	100pF 5% 50V
2650	5322 122 32531	100pF 5% 50V
2655	4822 124 40769	4,7μF 20% 100V
2658	4822 122 33575	220pF 5% 63V
2661	4822 124 21913	1μF 20% 63V
2662	5322 122 31647	1nF 10% 63V
2663	5322 122 32448	10pF 5% 63V
2664	4822 124 21913	1μF 20% 63V
2666	4822 124 40207	100μF 20% 25V
2668	5322 122 34099	470pF 10% 63V
2669	4822 126 13838	100nF +80/-20% 50V
2670	5322 122 32658	22pF 5% 50V
2681	4822 126 14585	100nF 10% 50V
2682	5322 122 34098	10nF 10% 63V
2685	4822 126 13838	100nF +80/-20% 50V
2686	4822 126 13838	100nF +80/-20% 50V
2687	4822 126 13751	47nF 10% 63V
2688	5322 122 31863	330pF 5% 63V
2689	5322 122 31863	330pF 5% 63V
2691	5322 122 32654	22nF 10% 63V
2692	5322 122 32654	22nF 10% 63V
2694	4822 126 13838	100nF +80/-20% 50V

RESISTORS

3501	4822 051 10102	1k 2% 0,25W
3502	4822 117 10833	10k 1% 0,1W
3511	4822 051 20182	1k8 5% 0,1W
3512	4822 051 20182	1k8 5% 0,1W
3513	4822 116 83961	6k8 5%
3514	4822 117 11507	6k8 1% 0,1W
3515	4822 117 11507	6k8 1% 0,1W
3516	4822 117 11507	6k8 1% 0,1W
3517	4822 051 20332	3k3 5% 0,1W
3518	4822 051 20332	3k3 5% 0,1W
3519	4822 051 20333	33k 5% 0,1W
3520	4822 051 20333	33k 5% 0,1W
3521	4822 116 52234	100k 5% 0,5W
3521	4822 116 83874	220k 5% 0,5W /FW-M55/37
3522	4822 116 52234	100k 5% 0,5W
3522	4822 116 83874	220k 5% 0,5W /FW-M55/37
3523	4822 117 11149	82k 1% 0,1W
3524	4822 117 11149	82k 1% 0,1W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 10102	1k 2% 0,25W
3527	4822 051 10102	1k 2% 0,25W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 117 11449	2k2 5% 0,1W
3530	4822 116 52256	2k2 5% 0,5W
3531	4822 116 52256	2k2 5% 0,5W
3532	4822 116 52256	2k2 5% 0,5W
3533	4822 116 52234	100k 5% 0,5W
3534	4822 116 52234	100k 5% 0,5W
3535	4822 117 10837	100k 1% 0,1W
3536	4822 117 10837	100k 1% 0,1W
3537	4822 051 20333	33k 5% 0,1W
3538	4822 051 20333	33k 5% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 10102	1k 2% 0,25W
3542	4822 051 10102	1k 2% 0,25W
3543	4822 117 11507	6k8 1% 0,1W
3544	4822 117 11507	6k8 1% 0,1W
3545	4822 051 20273	27k 5% 0,1W
3546	4822 116 52264	27k 5% 0,5W
3547	4822 051 20182	1k8 5% 0,1W
3548	4822 051 20182	1k8 5% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 117 10834	47k 1% 0,1W
3551	4822 051 20154	150k 5% 0,1W
3552	4822 051 20154	150k 5% 0,1W
3553	4822 051 20334	330k 5% 0,1W
3554	4822 117 10353	150R 1% 0,1W
3555	4822 051 20391	390R 5% 0,1W
3556	4822 117 11449	2k2 5% 0,1W
3557	4822 117 11149	82k 1% 0,1W
3558	4822 051 20225	2M2 5% 0,1W
3559	4822 051 20225	2M2 5% 0,1W
3560	4822 051 20475	4M7 5% 0,1W
3563	4822 117 11449	2k2 5% 0,1W
3564	4822 117 11449	2k2 5% 0,1W
3565	4822 117 11449	2k2 5% 0,1W
3566	4822 117 11449	2k2 5% 0,1W
3567	4822 051 20223	22k 5% 0,1W
3568	4822 051 20223	22k 5% 0,1W
3569	4822 051 20472	4k7 5% 0,1W

ELECTRICAL PARTS LIST - AF6 BOARD

RESISTORS

3570	4822 051 20472	4k7 5% 0,1W
3571	4822 051 20472	4k7 5% 0,1W
3572	4822 051 20472	4k7 5% 0,1W
3573	4822 051 20472	4k7 5% 0,1W
3574	4822 051 20472	4k7 5% 0,1W
3575	4822 117 11503	220R 1% 0,1W
3576	4822 117 11503	220R 1% 0,1W
3577	4822 050 11002	1k 1% 0,4W
3578	4822 050 11002	1k 1% 0,4W
3580	4822 051 10102	1k 2% 0,25W
3581	4822 117 11449	2k2 5% 0,1W
3582	4822 116 52256	2k2 5% 0,5W
3583	4822 117 11503	220R 1% 0,1W
3584	4822 117 11503	220R 1% 0,1W
3585	4822 117 10834	47k 1% 0,1W
3586	4822 117 10834	47k 1% 0,1W
3587	4822 051 20154	150k 5% 0,1W
3588	4822 051 20154	150k 5% 0,1W
3589	4822 117 11449	2k2 5% 0,1W
3590	4822 117 11449	2k2 5% 0,1W
3591	4822 051 20223	22k 5% 0,1W
3592	4822 051 20223	22k 5% 0,1W
3593	4822 116 52257	22k 5% 0,5W
3594	4822 116 52257	22k 5% 0,5W
3595	4822 051 20333	33k 5% 0,1W
3596	4822 117 10834	47k 1% 0,1W
3597	4822 051 20105	1M 5% 0,1W
3598	4822 051 20475	4M7 5% 0,1W
3599	4822 117 11148	56k 1% 0,1W
3600	4822 117 11148	56k 1% 0,1W
3601	4822 051 20332	3k3 5% 0,1W
3602	4822 051 20332	3k3 5% 0,1W
3603	4822 051 20684	680k 5% 0,1W
3604	4822 051 20684	680k 5% 0,1W
3605	4822 117 13579	220k 1% 0,1W
3606	4822 117 13579	220k 1% 0,1W
3607	4822 050 21003	10k 1% 0,6W
3608	4822 050 21003	10k 1% 0,6W
3609	4822 117 10833	10k 1% 0,1W
3610	4822 117 10833	10k 1% 0,1W
3611	4822 051 20562	5k6 5% 0,1W
3612	4822 051 20562	5k6 5% 0,1W
3613	4822 051 20562	5k6 5% 0,1W
3614	4822 051 20562	5k6 5% 0,1W
3615	4822 051 20562	5k6 5% 0,1W
3616	4822 051 20562	5k6 5% 0,1W
3617	4822 051 20822	8k2 5% 0,1W
3618	4822 051 20822	8k2 5% 0,1W
3619	4822 051 20822	8k2 5% 0,1W
3620	4822 051 20822	8k2 5% 0,1W
3621	4822 051 20822	8k2 5% 0,1W
3622	4822 051 20822	8k2 5% 0,1W
3623	4822 117 10834	47k 1% 0,1W
3624	4822 117 10834	47k 1% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3627	4822 117 11503	220R 1% 0,1W
3628	4822 117 11503	220R 1% 0,1W
3629	4822 117 11454	820R 1% 0,1W
3631	4822 116 52231	820R 5% 0,5W
3632	4822 116 52231	820R 5% 0,5W
3633	4822 051 20562	5k6 5% 0,1W
3634	4822 051 20562	5k6 5% 0,1W
3635	4822 117 10833	10k 1% 0,1W
3636	4822 117 10833	10k 1% 0,1W
3637	4822 117 10834	47k 1% 0,1W
3638	4822 117 10834	47k 1% 0,1W
3639	4822 117 11383	12k 1% 0,1W
3640	4822 117 11383	12k 1% 0,1W
3641	4822 052 10109 ⚠	10R 5% 0,33W
3642	4822 051 20472	4k7 5% 0,1W
3643	4822 051 20472	4k7 5% 0,1W
3645	4822 051 20479	47R 5% 0,1W
3646	4822 051 20479	47R 5% 0,1W
3647	4822 051 20479	47R 5% 0,1W
3648	4822 051 20479	47R 5% 0,1W
3649	4822 117 13577	330R 1% 1,25W
3650	4822 117 13577	330R 1% 1,25W
3651	4822 051 20392	3k9 5% 0,1W
3652	4822 051 20392	3k9 5% 0,1W
3655	4822 050 21003	10k 1% 0,6W
3656	4822 117 10833	10k 1% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 051 20562	5k6 5% 0,1W
3660	4822 051 20472	4k7 5% 0,1W
3661	4822 051 20475	4M7 5% 0,1W
3662	4822 051 10102	1k 2% 0,25W
3663	4822 051 10102	1k 2% 0,25W
3671	4822 117 13579	220k 1% 0,1W
3672	4822 117 13579	220k 1% 0,1W
3673	4822 117 12955	2k7 1% 0,1W
3674	4822 051 20334	330k 5% 0,1W
3675	4822 117 11449	2k2 5% 0,1W
3676	4822 051 20229	22R 5% 0,1W
3677	4822 051 20471	470R 5% 0,1W
3681	4822 052 10229 ⚠	22R 5% 0,33W
3682	4822 051 10102	1k 2% 0,25W
3683	4822 051 20471	470R 5% 0,1W
3684	4822 051 20392	3k9 5% 0,1W
3691	4822 117 11449	2k2 5% 0,1W
3699	4822 050 11002	1k 1% 0,4W
3768	4822 050 11002	1k 1% 0,4W
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - AF6 BOARD

RESISTORS

4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4566	4822 051 20008	0R Jumper 0805
4567	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4580	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5511	4822 157 62552	Coil 2,2µH 5%
5512	4822 157 10586	Coil 2,2µH 10%
5513	4822 157 10586	Coil 2,2µH 10%
5523	4822 157 62552	Coil 2,2µH 5%
5524	4822 157 10586	Coil 2,2µH 10%
5525	4822 157 10586	Coil 2,2µH 10%
5526	4822 157 62552	Coil 2,2µH 5%
5527	4822 157 10586	Coil 2,2µH 10%
5528	4822 157 10586	Coil 2,2µH 10%
5531	4822 157 62552	Coil 2,2µH 5%
5532	4822 156 21721	Coil 2,2µH 10%

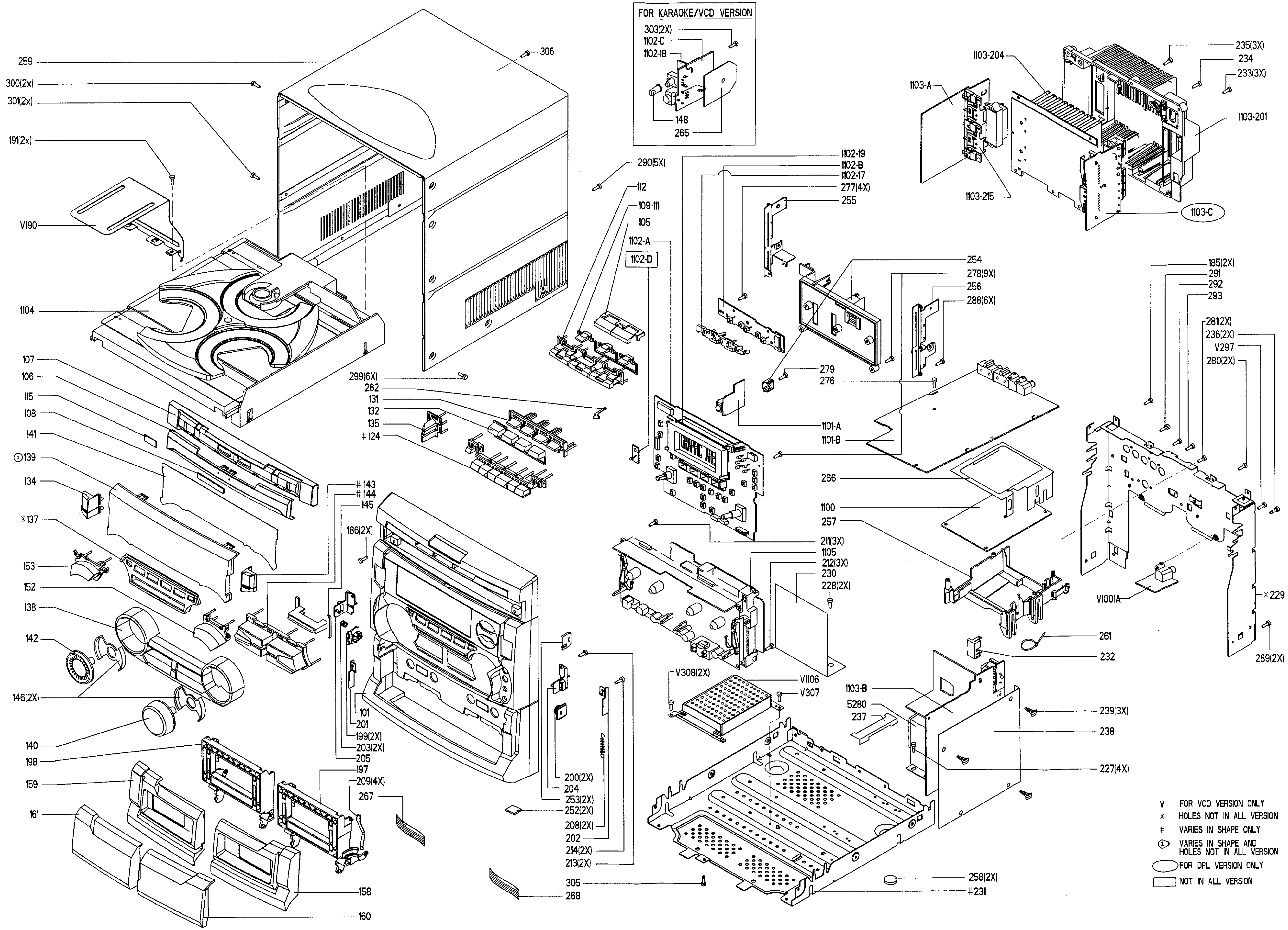
DIODES

6511	9338 871 90673	BZX55-F9V1
6512	9338 871 90673	BZX55-F9V1
6513	4822 130 31878	1N4003G
6515	4822 130 30621	1N4148
6516	4822 130 30621	1N4148
6531	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7511	4822 209 33652	TEA6321T/V1
7512	4822 209 83357	NJM4560M
7513	4822 209 83357	NJM4560M
7515	4822 209 31378	NJM4556AM
7521	4822 130 60511	BC847B
7522	4822 130 60511	BC847B
7523	4822 130 60511	BC847B
7524	4822 130 60511	BC847B
7525	4822 130 40959	BC547B
7526	4822 130 60373	BC857B
7527	4822 130 60511	BC847B
7528	4822 130 60511	BC847B
7529	4822 130 60373	BC857B
7531	4822 130 60511	BC847B
7532	4822 130 60511	BC847B
7533	4822 130 60511	BC847B
7534	4822 130 60511	BC847B
7535	4822 130 42804	BC817-25
7536	4822 130 42804	BC817-25
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7539	4822 130 60373	BC857B
7541	4822 130 60511	BC847B
7543	4822 130 42804	BC817-25
7551	4822 209 17345	M62320FP

Note : Only the parts mentioned in this list are normal service spare parts.


FOR KARAOKE/VCD VERSION
303(2X)
1102-C
1102-18
148
265
259
306
300(2x)
301(2x)
191(2x)
V190
1104
107
106
115
108
141
139
134
*137
153
152
138
142
146(2X)
140
198
159
161
158
160
290(5X)
112
109-111
105
1102-A
1102-D
299(6X)
262
131
132
135
#124
#143
#144
145
186(2X)
101
201
199(2X)
203(2X)
205
197
209(4X)
267
200(2X)
204
253(2X)
252(2X)
208(2X)
202
214(2X)
213(2X)
305
268
1102-19
1102-B
1102-17
277(4X)
255
254
278(9X)
256
288(6X)
279
276
1101-A
1101-B
266
1100
257
211(3X)
1105
212(3X)
230
228(2X)
V308(2X)
V1106
V307
1103-B
5280
237
261
232
239(3X)
238
227(4X)
258(2X)
#231
1103-204
1103-A
1103-215
235(3X)
234
233(3X)
1103-201
1103-C
185(2X)
291
292
293
281(2X)
236(2X)
V297
280(2X)
V1001A
*229
289(2X)
V FOR VCD VERSION ONLY
* HOLES NOT IN ALL VERSION
# VARIES IN SHAPE ONLY
VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
FOR DPL VERSION ONLY
NOT IN ALL VERSION

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

0101*	3139 118 10910	Cabinet Front
0101	4822 459 05252	Cabinet Front
0105*	3139 117 89750	Button CDC Open/Close
0105	4822 410 12296	Button CDC Open/Close
0106*	3139 118 12680	Cover Tray Orn
0106	3139 118 12730	Cover Tray Orn
0107*	3139 118 12670	Cover Tray CDC
0107	3139 118 12720	Cover Tray CDC
0108	4822 454 13408	Badge Philips
0112*	3139 117 89770	Button Set CDC Sel
0112	3139 118 12710	Button Set CDC Sel
0115	3139 110 00150	Badge Super Error Correction
0124*	3139 117 89970	Button Set Control
0124	3139 118 12740	Button Set Control
0131	4822 464 10514	Frame Lightguide Source Sel
0132*	3139 118 12650	Button Set Source
0132	3139 118 12530	Button Set Source
0134*	3139 117 89800	Button Standby/Timer
0134	4822 410 12291	Button Standby/Timer
0135*	3139 118 10150	Button Set Dub/Rec
0135	4822 410 12302	Button Set Dub/Rec
0137*	3139 117 89980	Cover Control
0137	3139 118 12750	Cover Orn Control
0138*	3139 118 12950	Cover Orn SNP
0138	3139 118 12760	Cover Orn SNP
0139*	3139 118 12660	Window Display
0139^	3139 118 12820	Window Display
0139#	3139 118 12540	Window Display
0140	3139 117 89830	Knob Volume Rotary
0142	3139 118 10130	Jog Rotary
0143*	3139 118 12690	Button Set PBC/Return
0143^	4822 410 12316	Button Set RDS/NEWS
0143#	4822 442 01761	Cover RDS/NEWS
0144*	3139 118 10870	Button Set SNP
0144	3139 118 12770	Button Set SNP
0148*	3139 118 10860	Knob Karaoke
0152*	3139 118 10110	Cover Max
0152	3139 118 12880	Cover Max
0153*	3139 118 10100	Cover More/Enter
0153	3139 118 12890	Cover More/Enter
0158*	3139 118 10880	Cover Cassette Right
0158	3139 118 12840	Cover Cassette Right
0159*	3139 118 10890	Cover Cassette Left
0159	3139 118 12850	Cover Cassette Left
0160*	3139 118 10820	Lens Cassette Right
0160	3139 114 69280	Lens Cassette Right
0161*	3139 118 10830	Lens Cassette Left
0161	3139 114 69290	Lens Cassette Left
0197	4822 443 10488	Door Cassette Right
0198	4822 443 10487	Door Cassette Left
0199	4822 402 10621	Push-Catch
0200	4822 529 10322	Damper Assembly
0203	4822 492 11344	Spring Compression
0204	4822 402 11246	Bracket Right
0205	4822 402 11245	Bracket Left
0208	4822 492 11345	Spring Tension
0209	4822 492 42787	Spring Cassette
0232	4822 402 10288	Bracket Mains Socket
0239	4822 466 93148	Spacer 5mm
0252	4822 462 40683	Foot Rubber (SQ)
0254	4822 466 12197	Plate Front
0258	4822 462 40683	Plate (Foot)
0259	3139 114 69230	Cabinet Rear
0350*	3139 118 77810	L/R Loudspeaker Box
0350	3139 118 77880	L/R Loudspeaker Box
0351	4822 303 50063	FM Aerial
0351#	4822 320 11094	FM Aerial
0352**	3139 118 77320	Surround Speaker Box
0356*	3139 228 85100	Remote Control
0356	3139 228 85250	Remote Control
0384	4822 303 50082	AM Frame Aerial
0385	4822 321 10249 ⚠	Mains Cord
0385#	4822 321 11466 ⚠	Mains Cord
0386*	4822 320 11642	Cinch Cable Assembly 1.7m
0387*	3139 115 20040	Instruction For Use
0387^	3139 115 20070	Instruction For Use
0387#	3139 115 20010	Instruction For Use
1106	3139 118 77760	Module MPEG99 ECO MP3
1571	4822 320 12702	FFC Foil 06P/140/06P BD
1573	4822 320 12654	FFC Foil 07P/220/07P AD
1653	4822 320 12703	FFC Foil 07P/140/07P BD
1680	4822 320 12656	FFC AD 09P 280 Folded
1681	3139 110 34460	FFC Foil 13P/480/13P BD
5002	4322 020 90860	Toroid Ring
5280*	4822 146 10755 ⚠	Mains Transformer
5280^	4822 146 10728 ⚠	Mains Transformer
5280#	4822 146 11129 ⚠	Mains Transformer

* For FW-V55/21M/21K only
** For FW-V55/21K only
^ For FW-M55/22 only
# For FW-M55/37 only

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

9965 000 04254	Woofer 5,25" 6R 50W
9965 000 04255	Tweeter 2,5" 8R 10W
9965 000 04256	Woofer Ring
9965 000 03233	Grommet
9965 000 03237	Cloth Frame Assembly (For FW-V55/21M/21K only)
9965 000 04257	Woofer 5,25" 6R 50W
9965 000 04258	Tweeter 2,5" 8R 10W
9965 000 04259	Woofer Ring
9965 000 03233	Grommet
9965 000 04260	Cloth Frame Assembly (For FW-M55/22/37 only)

SURROUND SPEAKER BOX BREAKDOWN

4822 240 10374	Speaker 3" 6R 7W (For FW-V55/21K only)

Note : Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

185	D3 x 10
186	D3 x 10
191	M3 x 6
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
227	M3 x 6
228	M3 x 6
233	M3 x 10
234	D3 x 12
235	M3 x 10
236	M3 x 10
276	D3 x 12
277	D3 x 12
278	D3 x 12
279	M3 x 12
280	D3 x 12
281	D3 x 12
288	D3 x 10
289	M3 x 10
290	M3 x 10
291	D3 x 12
292	D3 x 12
293	D3 x 12
297	D3 x 12
299	M3 x 10
300	M3 x 10
301	M3 x 10
303	D3 x 12
305	M3 x 6
306	M3 x 10
307	M3 x 6
308	M3 x 6

07-11

FW-V55 & FW-M55

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Service
Service
Service

Product Service Group CE Audio

Service Information

Already published Service Informations :

CORRECTION TO SERVICE MANUAL

*** Correction of parts list (Page 14-2) for MAIN UNIT:**
Change 0132 3139 117 89920 Button Set Source
Delete 0115
(For FW-M55/22/37 only)

CHANGES DURING PRODUCTION

FRONT BOARD

* From production week 0033 onwards the following has been changed to improve FCC requirements.

Add 2999 4822 126 14076 220nF +80/-20% 25V
Change 2462 4822 126 14076 220nF +80/-20% 25V
(For FW-M55/37 only)

* From production week 0039 onwards the software of the main processor IC (7400) has been upgrade to version 17. The service code is 9965 000 08007.

MPEG BOARD

* From production week 0029 onwards the software of the main processor IC (7202) has been upgrade to version 07. The service code is 9965 000 05010.

* From production week 0036 onwards the software of the main processor IC (7202) has been upgrade to version 08. The service code is 9965 000 05010.

ETF7 TAPE MODULE

* From production week 0021 onwards the following has been changed to improve ESD.

Add 3687 4822 117 11503 220R 1% 0,1W
Delete 2624, 4785

FW-V55 & FW-M55

A01 - 152

5441

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published Service Informations :

CORRECTION TO SERVICE MANUAL

* **Correction of parts list (Page 14-2) for MAIN UNIT:**

Change	0132	3139 117 89920	Button Set Source
Delete	0115		

(For FW-M55/22/37 only)

CHANGES DURING PRODUCTION

FRONT BOARD

* From production week 0033 onwards the following has been changed to improve FCC requirements.

Add	2999	4822 126 14076	220nF +80/-20% 25V
Change	2462	4822 126 14076	220nF +80/-20% 25V

(For FW-M55/37 only)

* From production week 0039 onwards the software of the main processor IC (7400) has been upgrade to version 17. The service code is 9965 000 08007.

MPEG BOARD

* From production week 0029 onwards the software of the main processor IC (7202) has been upgrade to version 07. The service code is 9965 000 05010.

* From production week 0036 onwards the software of the main processor IC (7202) has been upgrade to version 08. The service code is 9965 000 05010.

ETF7 TAPE MODULE

* From production week 0021 onwards the following has been changed to improve ESD.

Add	3687.	4822 117 11503	220R 1% 0,1W
Delete	2624, 4785		

02 - 08 - 2001

3139 785 22990